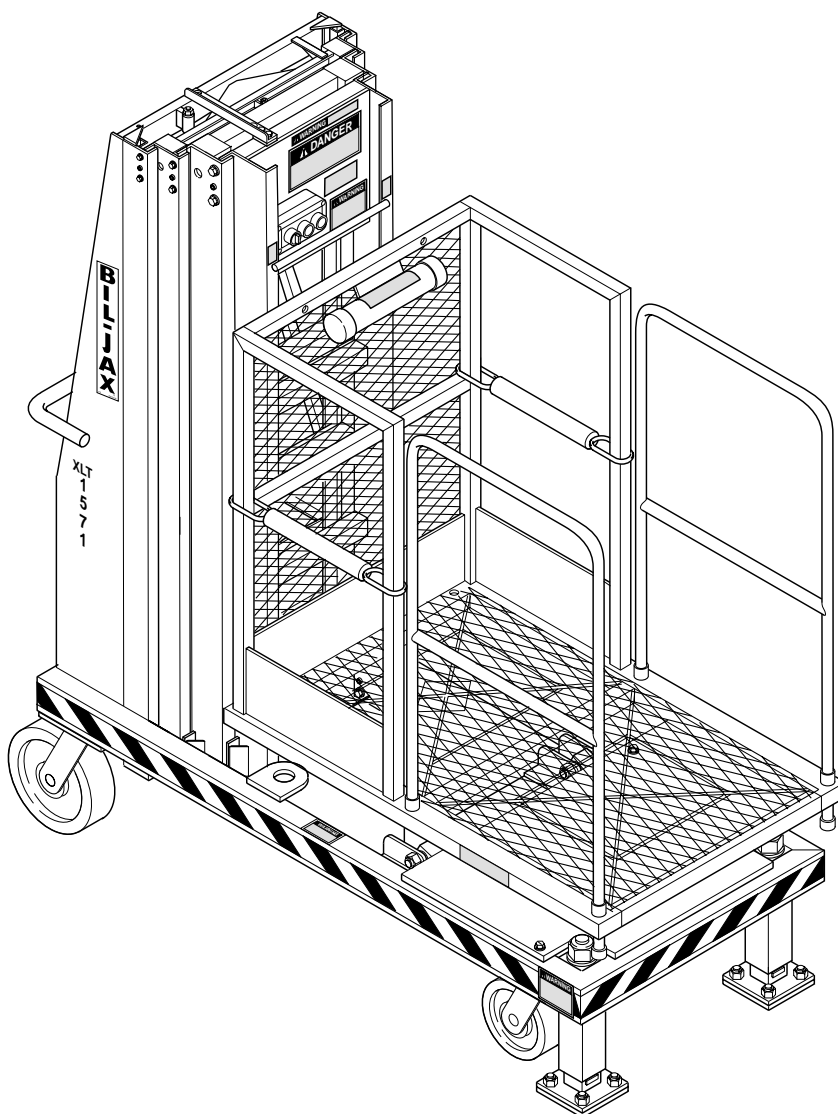




Model XLT-1571DC Operation and Maintenance Manual

COUGAR LIFT® Electric Hydraulic Lift Platform



TELESCOPIC PERSONNEL LIFT

This equipment is designed and manufactured in compliance with the duties, responsibilities, and standards set forth for manufacturers in the ANSI 92.3 standard in effect at the time of manufacture.

This equipment will meet or exceed applicable OSHA codes and ANSI A92.3 standards when used in accordance with sections 5, 6, 7, 8, 9 & 10 of ANSI A92.3 and all other manufacturer's recommendations.

It is the responsibility of the user of this equipment to follow all applicable ANSI, OSHA, Federal, State, and local codes and regulations that govern the safe operation of this equipment.

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1

Safety

1-1 INTRODUCTION

Familiarity and proper training are required for the safe operation of mechanical equipment. Equipment operated improperly or by untrained personnel can be dangerous. Read the operating instructions in this manual and become familiar with the location and proper use of all controls. Inexperienced operators should receive instruction from someone familiar with the equipment before being allowed to operate the machine. The use of intelligence and common sense in the operation of mechanical equipment is the best practice in any safety policy. Be professional and always observe the safety procedures set forth in this manual.

All OSHA, ANSI, state and local codes and regulations pertaining to this equipment should be obtained, read, and thoroughly understood before attempting to operate this equipment. Persons under the influence of drugs, alcohol, or prescription medication should not be on or near this equipment. Common sense should be implemented at all times during the use of this equipment. Do not operate this equipment in areas where equipment or user may come in contact with live power source.

The information contained herein is not to be considered as legal advice and is intended for informational purposes only. This information is offered to alert Bil-Jax customers to procedures that may be of concern to them.

This information is not intended to be all inclusive and is to be followed in the use of Bil-Jax equipment only.

For any questions concerning the safe use of this equipment, call 419.445.9675 before operating.

Safety Notes

This manual contains DANGERS, WARNINGS, CAUTIONS, and NOTES that must be followed to prevent the possibility of improper service, damage to the equipment, or personal injury.



DANGER

Dangers warn of equipment operation near electrical power lines that could lead to personal injury or death.



WARNING

Warnings describe conditions or practices that could lead to personal injury or death.



CAUTION

Cautions provide information important to prevent errors that could damage machine or components.

NOTE: Notes contain additional information important to a procedure.

1-2 BEFORE OPERATION

Ensure the following general safety precautions are followed before operating the Cougar Lift.

- ALWAYS survey the usage area for potential hazards such as untampered earth fills, unlevel surfaces, overhead obstructions, and electrically charged conductors or wires. Be aware of any potential hazards and always consider what could happen. Watch for moving vehicles in the operating area.
- ALWAYS read, understand, and follow the procedures in this manual before attempting to operate equipment.
- ALWAYS inspect the equipment for damaged or worn parts. Check for cracked welds, hydraulic leaks, damaged wiring, loose wire connectors, damaged casters, and damaged floor pads. Also check for any improper operation. NEVER operate equipment if damaged in any way. Improperly operating equipment must be repaired before using.
- ALWAYS wear proper clothing for the job. Wear protective equipment as required by federal, state, or local regulations.
- ALWAYS locate, read, and follow all directions and warnings displayed on the equipment.
- ALWAYS inspect the equipment for any “DO NOT USE” tags placed on the equipment by maintenance personnel. NEVER use any equipment tagged in this way until repairs are made and all tags are removed by authorized maintenance personnel.
- ALWAYS make sure the platform and shoes are free of mud, grease, or other foreign material. This will reduce the possibility of slipping.
- NEVER allow improperly trained personnel to operate this equipment. Only trained and authorized personnel shall be allowed to operate this equipment.
- NEVER operate this equipment if you are under the influence of alcohol or drugs or if you feel ill, dizzy, or unsteady in any way. Operators must be physically fit, thoroughly trained, and not easily excitable.
- NEVER modify, alter, or change the equipment in any way that would affect its original design or operation in any way.
- NEVER operate this equipment in ways for which it is not intended.

1-3 DURING OPERATION

Ensure the following general safety precautions are followed during the operation of the Cougar Lift.



DANGER

This machine is not insulated for use near electrical power lines and DOES NOT provide protection from contact with or close proximity to any electrically charged conductor. Operator must maintain safe clearances at all times (10 feet minimum) and always allow for platform movement such as wind induced sway. Always contact the power company before performing work near power lines. Assume every line is hot. Remember, power lines can be blown by the wind.

Refer to Table 1-1 for minimum safe approach distances between machine and electrical power lines.

Table 1-1. Minimum Safe Approach Distances

Voltage Range (Phase to Phase)	Minimum Safe Approach Distance	
	(Feet)	(Meters)
0 to 300V	Avoid Contact	
Over 300V to 50KV	10	3.05
Over 50KV to 200KV	15	4.60
Over 200KV to 350KV	20	6.10
Over 350KV to 500KV	25	7.62
Over 500KV to 750KV	35	10.67
Over 750KV to 1000KV	45	13.72

- ALWAYS position lift far enough away from power sources to ensure that no part of the lift can accidentally reach into an unsafe area.
- ALWAYS operate only on a firm and level surface. NEVER use on surfaces that do not support the weight of the equipment and its rated load capacity.
- ALWAYS keep yourself and all personnel away from potential pinch or shear points.
- ALWAYS report any misuse of equipment to the proper authorities. Horseplay is prohibited.
- ALWAYS maintain good footing on the platform. NEVER wear slippery soled shoes.
- ALWAYS make certain all personnel are clear and there are no obstructions before repositioning platform.
- ALWAYS cordon off area around the base to keep personnel and other equipment away from it while in use.
- ALWAYS stay clear of wires, cables, and other overhead obstructions.
- ALWAYS disconnect power at the batteries when not in use to guard against unauthorized use.

- NEVER allow electrode contact with any part of the platform if welding is being performed by a worker from the platform.
- NEVER use without the floor pads fully based on the floor.
- NEVER override or by-pass manufacturer's safety devices.
- NEVER release floor locks or move unit with a person or materials on board.
- NEVER stand or sit on guard rails. Work only within the platform guard rail area and do not lean out over guard rails to perform work.
- NEVER attempt to increase working height with boxes, ladders, or other means.
- NEVER operate this equipment when exposed to high winds, thunderstorms, ice, or any other weather conditions that would compromise the safety of the operator.
- NEVER climb up or down masts.
- NEVER allow ropes, electric cords, hoses, etc. to become entangled in the equipment when the platform is being raised or lowered.
- NEVER exceed manufacturer's platform load limits and make sure all materials are evenly distributed over the entire platform.
- NEVER exceed platform load ratings by transferring loads to platform at elevated heights.
- NEVER use guard rails to carry materials and never allow overhang of materials when raising or lowering platform.

1-4 MAINTENANCE SAFETY

Ensure the following general safety precautions are observed when maintenance is performed on the Cougar Lift.

- ALWAYS perform maintenance procedures according to manufacturer's requirements. NEVER short change maintenance procedures.
- ALWAYS check hydraulic system. Make sure all lines, connectors, and fittings are tight and in good condition.
- ALWAYS keep all mechanisms properly adjusted and lubricated according to maintenance schedule and manufacturers specifications.
- ALWAYS perform a function check of operating controls before each use and after repairs have been made.
- ALWAYS locate and protect against possible pinch points prior to performing maintenance and repairs.
- ALWAYS use only factory approved parts to repair or maintain this equipment. If this equipment is rebuilt, retesting is required in accordance with factory instructions.
- NEVER add unauthorized fluids to the hydraulic system or battery. Check manufacturers specifications.
- NEVER exceed the manufacturer's recommended relief valve settings.
- NEVER attempt repairs you do not understand. Consult manufacturer if you have any questions regarding proper maintenance, specifications, or repair.

Battery Maintenance

Ensure the following general safety precautions are followed when battery maintenance is being performed on the Cougar Lift.

- ALWAYS check battery acid level daily. Check battery test indicator for proper state of charge on maintenance free batteries before using lift.
- ALWAYS wear safety glasses when working near battery.
- ALWAYS avoid contact with battery acid. Battery acid causes serious burns. Avoid contact with skin or eyes. If accidental contact occurs, flush with water and consult a physician immediately.
- ALWAYS disconnect ground cable first when removing battery.
- ALWAYS connect ground cable last when installing battery.
- ALWAYS charge batteries in open, well ventilated areas.
- NEVER smoke when servicing battery.
- NEVER allow batteries to overcharge and boil.
- NEVER short across battery posts to check for current. NEVER break a live circuit at battery.
- NEVER jump start other vehicles using lift battery.

1-5 DAMAGED EQUIPMENT POLICY

Safety Statement

At Bil-Jax, we are dedicated to the safety of all users of our products. Therefore, all Bil-Jax lifts are designed, manufactured and tested to comply with current applicable Federal OSHA and ANSI codes and regulations.

Damage Policy

There may be occasions when a Bil-Jax lift is involved in an incident that results in structural damage to the lift. This can seriously compromise the ability of the lift to perform in a safe manner. Therefore, whenever a Bil-Jax lift is damaged structurally or when there is the possibility of structural damage (this damage may be internal and is not always visible to the naked eye), Bil-Jax requires that the lift be returned to our facility at 125 Taylor Parkway, Archbold, Ohio, for reconditioning. If you have any questions concerning what constitutes structural damage, please call the Bil-Jax Service Department at 419.445.9675.

Damage Repair Notice

There may be occasions when a Bil-Jax lift is involved in an incident resulting in non-structural damage. When this occurs and repairs are made by the owner or area distributor, please notify Bil-Jax of these non-maintenance repairs and request a repair form to be filled out and returned to Bil-Jax.

2

Introduction

2-1 GENERAL DESCRIPTION

The model XLT-1571 Cougar Lift is designed and manufactured for use as a warehouse stocking and order picking machine. Its unique guard rail design permits the operator to ride on the platform with the load, while transferring it from ground level to its overhead storage location. The maximum platform load is limited to 500 lbs. The electric pump motor is powered by a 12VDC battery. A 20 amp automatic battery charger is included for recharging the battery at the end of each work period.

Platform elevation is accomplished by means of a 1-1/2 inch displacement type hydraulic cylinder. The lower telescoping section is pushed vertically upward by the cylinder while the upper sections are raised by a mechanical motion advantage accomplished through two sets of chains and sheaves. The platform is raised three inches for each one inch of cylinder extension. Platform elevation and descent is controlled by pushbuttons on the upper control box located on the platform.

Safety of operation is assured by proper inspection and maintenance procedures as set forth in this manual. The possibility of platform free-fall is eliminated by proper maintenance and replacement of the chains, sheaves and sheave pins, a properly installed flow restrictor valve, and a clean mast. The non-adjustable restrictor valve controls and fixes the rate of platform descent whether empty or fully loaded to approximately 0.6 feet per second. A hydraulic hose failure will result in the same rate of descent, eliminating free-fall, when the restrictor valve is installed properly.

Emergency lowering of the platform is accomplished by means of a manual control valve located on the hydraulic manifold block assembly, next to the pump/motor unit.

The Cougar Lift features a displacement type of cylinder that will not rust or corrode during storage since the cylinder rod is immersed in oil. It is important that the cylinder rod be kept clean and undamaged for the protection of the cylinder head packing.

The floor lock safety switch prevents the unit from raising until the two floor pads have been properly engaged and helps to make the Cougar Lift a safe, dependable machine.

Carefully read all the safety instructions contained in Section 1 of this manual before operating the Cougar Lift.

2-2 SPECIFICATIONS

Cougar Lift Electric Hydraulic Lift Platform

Model Number XLT-1571

Serial Number _____

Manufactured by: Bil-Jax, Inc.
 125 Taylor Parkway
 Archbold, Ohio 43502
 419.445.9675

Table 2-1. Specifications

Rated Platform Load	500 lbs (227 kg) total including operator [1 person + materials not to exceed 500 lbs (227 kg)]
Extended Platform Height	14 ft-10 in. (4.5 m)*
Retracted Platform Height	18-1/2 in. (0.47 m)
Platform Dimensions	29 in. w x 50 in. l x 42 in. h (0.74 m x 1.27 m x 1.07 m)
Base Dimensions	30-1/2 in. w x 71 in. l x 77 in. h (0.77 m x 1.8 m x 1.95 m)
Retracted Dimensions	30-1/2 in. w x 73-1/2 in. l x 77 in. h (0.77 m x 1.87 m x 1.95 m)
Gross Shipping Weight	1025 lbs (465 kg)
Full Extension Time	20 seconds empty, 32 seconds loaded
Complete Retraction Time	22 seconds empty, 22 seconds loaded
Platform Extension Rate	0.66 ft (0.3 m)/sec. empty 0.42 ft (0.19 m)/sec. loaded
Hydraulic System Pressure	1200 psi empty, 2100 psi loaded
Power Source	DC - 12 volt deep cycle battery

* Home Depot units are equipped with a 12' Stockpicker™ Lift Option, B03-00-0137.
 This option limits extended platform height 12 feet.

2-3 WARRANTY

Bil-Jax warrants its telescopic lifts for three years from the date of delivery against all defects of material and workmanship, provided the unit is operated and maintained in compliance with Bil-Jax's operating and maintenance instructions. Bil-Jax will, at its option, repair or replace any unit or component part which fails to function properly in normal use.

This warranty does not apply if the lift and/or its component parts have been altered, changed, or repaired without the consent of Bil-Jax or by anyone other than Bil-Jax or its factory trained personnel, nor if the lift and/or its components have been subjected to misuse, negligence, accident or any conditions deemed other than those considered as occurring during normal use.

Components not manufactured by Bil-Jax, are covered by their respective manufacturers warranties. A list of those components and their warranties is available upon written request to Bil-Jax.

Bil-Jax shall not in any event be liable for the cost of any special, indirect or consequential damages to anyone, product, or thing. This warranty is in lieu of all other warranties expressed or implied. We neither assume nor authorize any representative or other person to assume for us any other liability in connection with the sale, rental, or use of this product.

3

Operation

3-1 OPERATOR CONTROLS

The operator controls for the Cougar Lift are contained on the upper and lower control boxes.

Lower Control Box

The lower control box is located on the front of the base platform and contains 3 pushbutton controls, EMERGENCY STOP, WHEEL DOWN/BASE ROLLS, and WHEEL UP/BASE SET. The controls on the lower control box are used to set the unit in proper position before the platform can be raised. Refer to Figure 3-1.

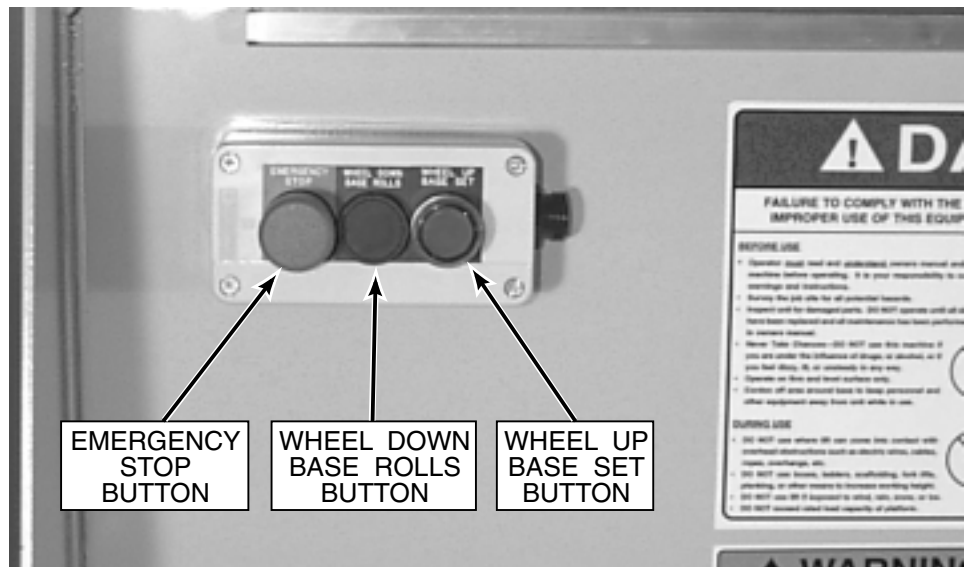


Figure 3-1. Lower Control Box

Upper Control Box

The upper control box is located on the back of the top mast and is accessible from the platform. The upper control box contains 3 controls, UP/DOWN selector switch, EMERGENCY STOP pushbutton, and ON pushbutton. The controls on the upper control box are used to raise and lower the unit. Refer to Figure 3-2.

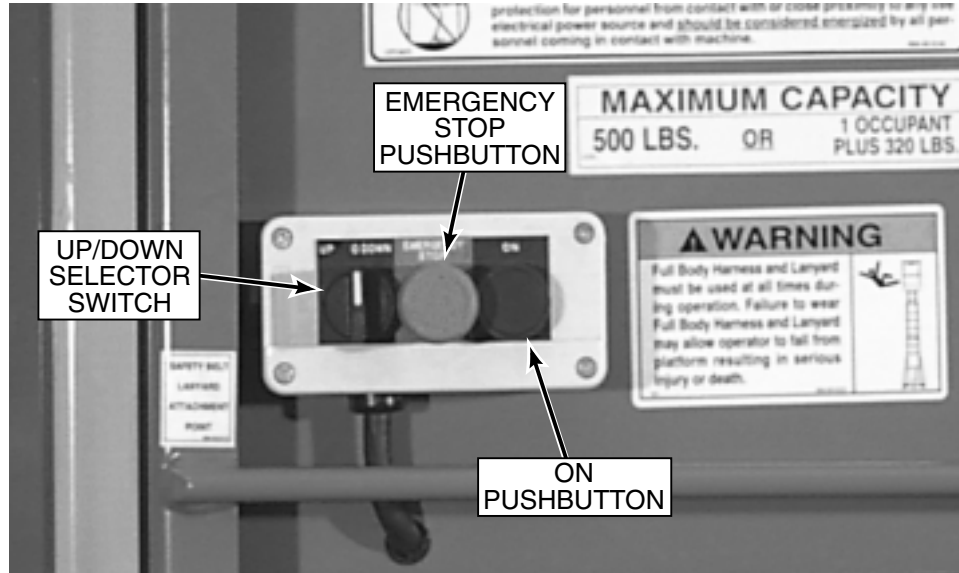


Figure 3-2. Upper Control Box

3-2 NORMAL OPERATING PROCEDURE

Perform the following procedures to operate the Cougar Lift.

1. Read and follow all safety precautions contained in Section 1 and all responsibilities outlined in the ANSI A92.3 reprint contained in Section 7 of this manual.
2. Position the lift at the work area. Make sure the lift is on a firm and level surface and that there are no potential hazards such as overhead obstructions or electrically charged conductors. Do not operate the lift if such hazards exist.
3. Check the lift for damaged or worn parts and repair or replace as necessary.
4. Check to be sure that the platform is properly attached to the lift.
5. Raise the casters located under the platform by depressing the WHEEL UP/BASE SET pushbutton located on the lower control box. Raising the casters allows the base to set firmly on the two foot pads.
6. The lift should be level and positioned on the two foot pads with the WHEEL UP/BASE SET pushbutton lit green. Ensure that the platform's upward path of travel is free from obstructions. Reposition the lift if necessary.

NOTE: The lift is equipped with a level sensor that will prevent the lift from raising if the lift is at a slope greater than 1 degree. The green WHEEL UP/BASE SET pushbutton will no longer illuminate until the lift is re-leveled.

7. Enter the platform. Ensure that both side midrails are positioned properly.

8. The lift is now ready for operation. While depressing the ON pushbutton, select the desired function, UP or DOWN on the position selector switch. The platform will raise or lower respectively. The EMERGENCY STOP pushbutton deactivates the control circuit.

NOTE: Should the platform continue to rise after the UP switch is released, press the ON pushbutton and select the DOWN position at the same time and the platform should stop or lower.

3-3 EMERGENCY LOWERING PROCEDURE

The Cougar Lift is equipped with a manual lowering valve in case of emergency situations to lower the platform. The emergency lowering valve is located on the hydraulic block manifold in the hydraulic pump compartment. The valve may be accessed through the opening on the base door. To lower the platform, turn the red knob on the valve counterclockwise. Refer to Figure 3-3.

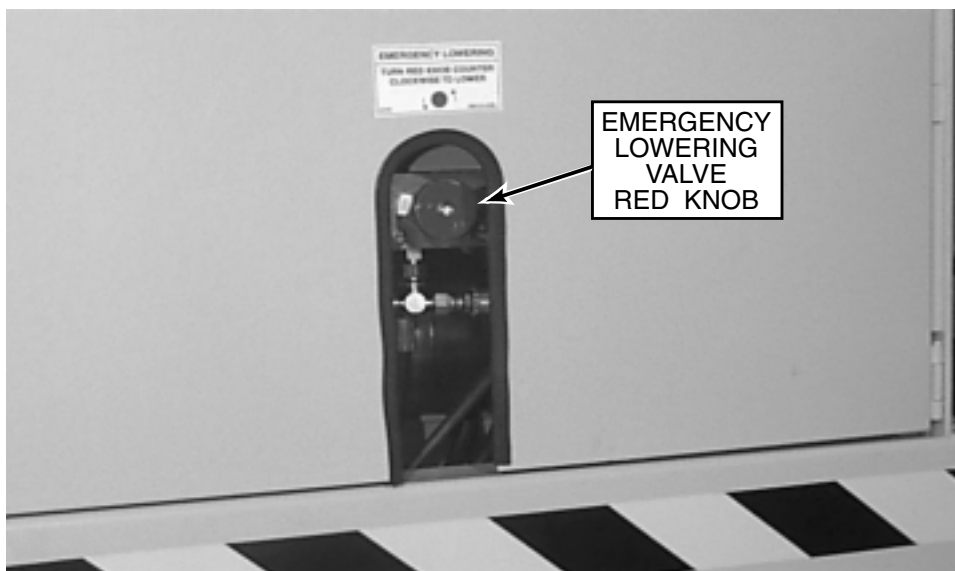


Figure 3-3. Emergency Lowering Valve

4

Maintenance

4-1 SCHEDULED SERVICE CHECKS

Daily/Weekly Service Checks

Perform the following daily/weekly service checks as listed in Table 4-1.

Table 4-1. Daily/Weekly Service Checks

Service Check	Daily before use	Weekly
Ensure Operation Manual is located in manual tube.	✓	
Check chain assemblies for split leaves, loose pins, excessive wear, or elongation.	✓	
Check battery electrolyte level.	✓	
Check and retighten all nuts and bolts.	✓	
Check cage attachment to the platform is secure and that the cage side midrails slide freely.	✓	
Check to be sure slide blocks and their path are clean and lightly lubricated with a silicone lubricant.	✓	
Check level sensor.	✓	
Check to see that all decals are present.	✓	
Check that all functions at lower and upper control boxes are operating properly.	✓	
Check for wear on chain sheaves, sheave axles, and bearings.		✓
Lubricate chains with 40W oil.		✓
Check casters for wear on axles and swivel raceways.		✓
Check surface of casters for cracks or excessive wear.		✓

Monthly Service Checks

Perform the following monthly service checks as listed in Table 4-2.

Table 4-2. Monthly Service Checks

Service Check	Every month	Every 6 months	Every 12 months	Every 48 months
Check hydraulic raise valve operation.	✓			
Clean battery terminals.	✓			
Check operation of manual emergency lowering valve.	✓			
Lubricate caster swivels and axles.		✓		
Check battery cables and wiring for loose connections and damaged wires.		✓		
Replace hydraulic oil.			✓	
Check slide blocks for wear.			✓	
Check for mast sway.			✓	
Load test with 500 pounds.			✓	
Replace lift chains.				✓

4-2 LUBRICATION

Lubrication makes operation of the Cougar Lift more efficient and extends the life of the unit. Perform the following lubrication procedures.

1. Oil lift chains with clean 40W oil weekly or as needed. Refer to Figure 4-1.

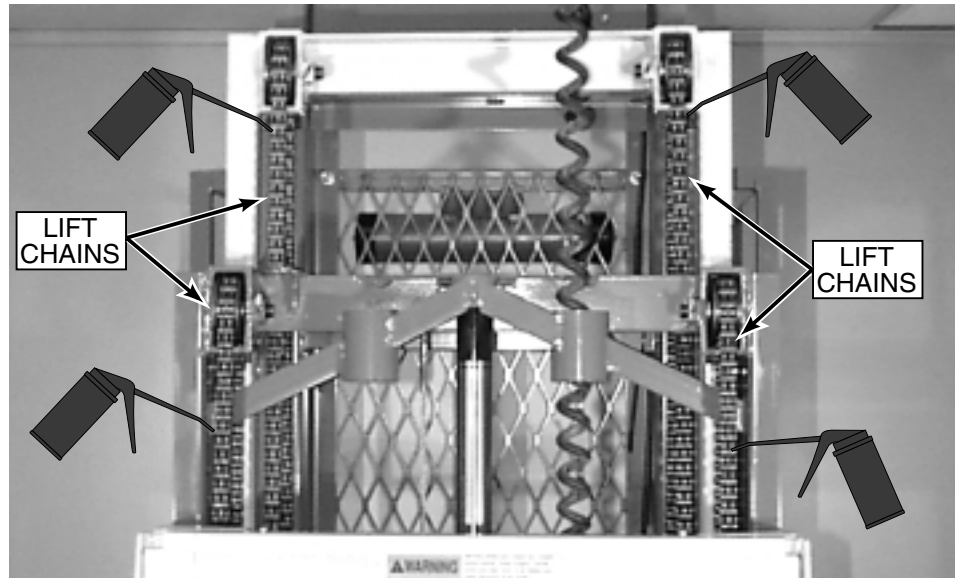


Figure 4-1. Lift Chain Lubrication

2. Grease all caster axles and swivel raceways at the 2 grease fittings on each caster semiannually with wheel bearing grease. Refer to Figure 4-2.

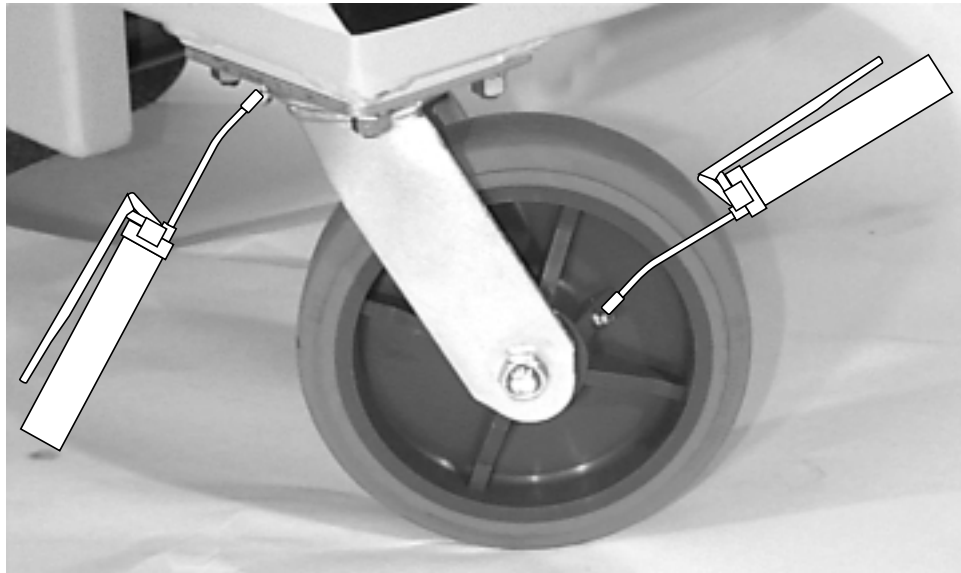


Figure 4-2. Caster Lubrication

NOTE: The plastic slide blocks in the mast are made of a bearing material which has a high degree of lubricity and need only be kept clean. However, precautions should be taken to ensure that the paths along which the blocks move are kept clean and lightly lubricated with a dry type silicon lubricant.

4-3 HYDRAULIC SYSTEM

Hydraulic system maintenance varies by the amount of use and the environment in which the lift is used. Constant attention to keep the oil clean and the reservoir properly filled will help prevent possible damage to the system.

Hydraulic System Inspection

Check all hydraulic hoses and fittings for leaks and damage daily. Tighten or replace as necessary to prevent hydraulic oil loss. Refer to the hydraulic schematic diagram in Section 6 for general reference.

Fluid Check and Replacement

The reservoir should be filled to within 1/2 inch of the top with the platform in its lowest position. The lift is shipped from the factory with Energol HLP-HD46 (BP Oil), a high grade, non-foaming hydraulic oil designed for temperatures as low as -20°F/-29°C. Use Dextron Automatic Transmission Fluid Type A for temperatures as low as -40°F/-40°C. If either oil is not available, a good grade SAE 10W hydraulic oil may be used where the minimum climatic temperature is above 32°F/0°C. SAE 5W hydraulic oil may be used where temperatures are as low as 0°F/-18°C. Do not mix different hydraulic oils. Clean the reservoir sump strainer and replace the hydraulic oil at least once a year or whenever it becomes contaminated.

Hydraulic System Air Bleeding Procedure

Delayed response or sporadic action in the unit may indicate a presence of air in the cylinder. Perform the following procedure to bleed air from the system.

1. Fill the reservoir with the proper hydraulic fluid.
2. Fully extend the lift.
3. Lower the unit to allow the oil with entrapped air to return to the reservoir, being careful not to overflow it.
4. Let the unit set while the air escapes the fluid and then repeat if necessary. Each time the platform is lowered, refill the reservoir to prevent pumping more air into the cylinder.

Pressure Relief Valve Reset

Perform the following procedure to reset the pressure relief valve. Refer to Figure 4-3.

1. Disconnect the hydraulic hose from the main pressure port.
2. Install a 4000 psi gauge into the main pressure port in the pump unit.



CAUTION

Do not adjust the pressure relief valve higher than 2100 psi. Overloading may occur at pressures greater than 2100 psi.

3. Remove the hex cover from the pressure relief valve.
4. While depressing the WHEEL DOWN/BASE ROLLS pushbutton on the lower control box, adjust the screw until maximum pressure of 2100 psi is obtained.
5. After adjusting the pressure relief valve, replace the hex cover, remove the 4000 psi gauge, and reconnect the hydraulic hose to the main pressure port.
6. If a gauge is unavailable, place 500 pounds on the platform and adjust the pressure relief valve screw so that the load can just be lifted without bypassing oil through the pressure relief valve.

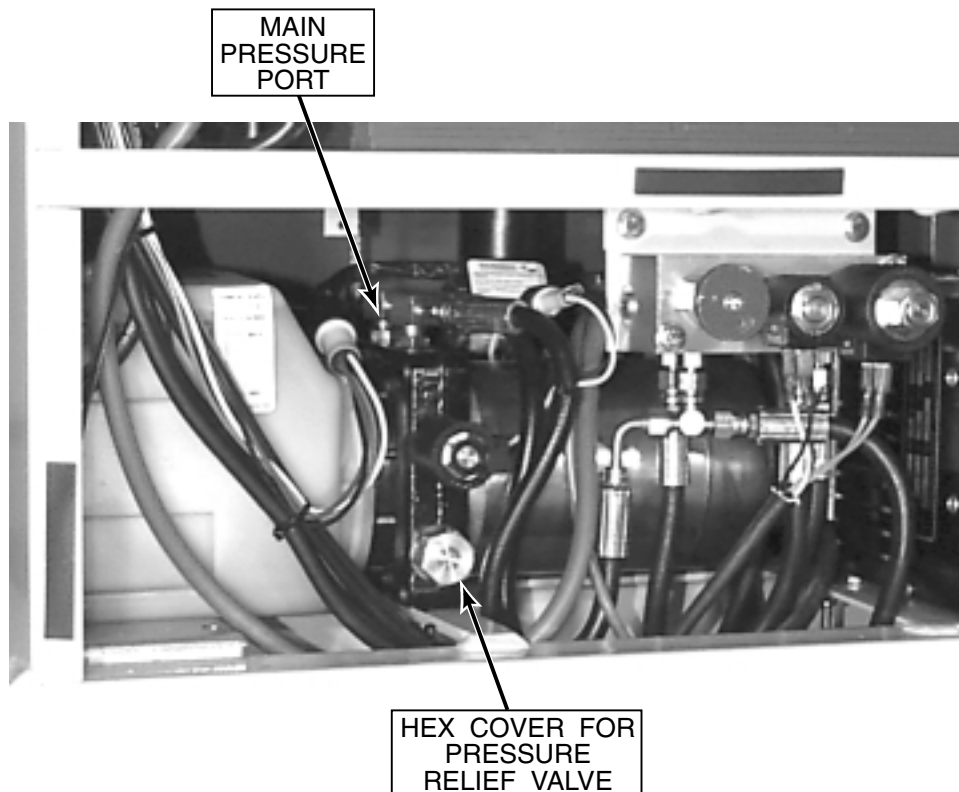


Figure 4-3. Pressure Relief Valve Adjustment

Flow Restrictor Valve Replacement

If the flow restrictor valve Figure 4-4 needs to be removed or replaced, it is important that it be properly reinstalled. The valve will be marked either with an arrow or with the word “IN”. If marked with an arrow, the arrow must point away from the hydraulic cylinder port. If marked with the word “IN”, the end of the valve marked “IN” must be toward the hydraulic cylinder port. Only a 1/4 inch NPT hydraulic elbow should be connected between the hydraulic cylinder port and the end of the flow restrictor valve.

Improper installation of the flow restrictor valve or the use of the wrong size elbow will permit widely varying rates of descent and may result in near free-fall in case of hose failure.

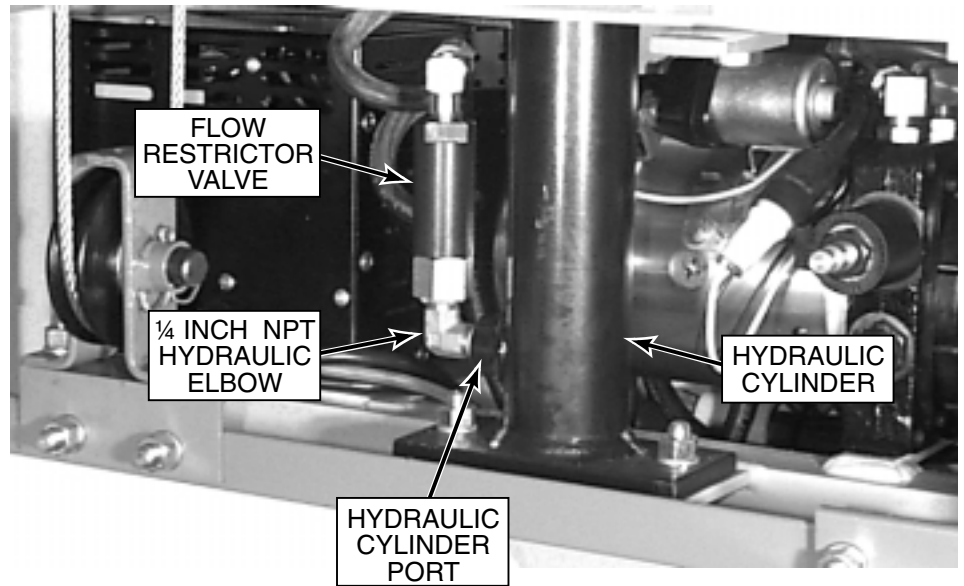


Figure 4-4. Flow Restrictor Valve

Raise Valve Operation Check

The raise valve is a normally open (N.O.) valve in the hydraulic system. Perform the following procedures to check the operation of the raise valve.

1. Disconnect the black and yellow wires from the solenoid, to the valve at the wire connector, Figure 4-5.
2. On the upper control box, select UP on the direction selector switch while depressing the ON pushbutton. This should cause the motor to run without the platform raising.
3. If the platform raises, the raise valve must be cleaned or replaced.
4. Reconnect the wires at the connector between the solenoid and the raise valve upon determining that the valve is functioning properly.

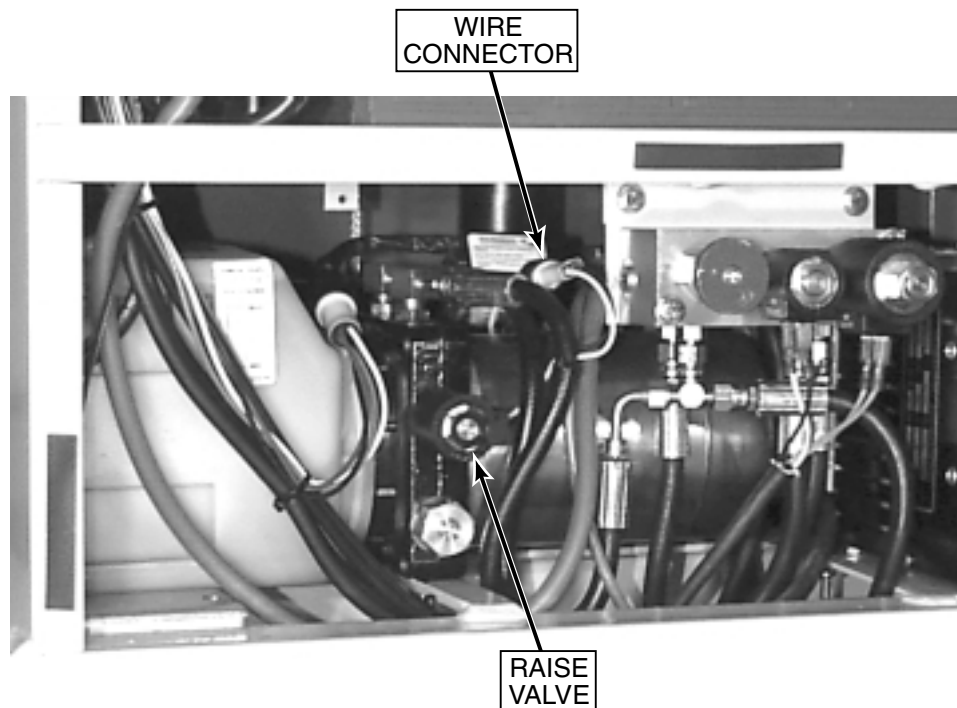


Figure 4-5. Raise Valve Operation Check

Hydraulic Cylinder Repair



CAUTION

Removing the hydraulic cylinder from the Cougar Lift requires major disassembly of the unit. Contact Bil-Jax before removing the hydraulic cylinder from the unit for assistance.

Hydraulic Cylinder Removal

It is recommended that Bil-Jax be contacted for assistance before removing the hydraulic cylinder.

1. Be sure cylinder is completely retracted and pressure is released from the system. Place a pan underneath the hydraulic cylinder to catch the hydraulic oil.
2. Disconnect the hydraulic hose from the bottom of the cylinder and drain the hydraulic oil. Remove the two bolts, washers, and nuts securing the bottom of the cylinder to the base.
3. Remove the plexiglass cover from the base.
4. Remove the mounting bolt, washer, and nut securing the top of the hydraulic cylinder to the lower mast.
5. Disconnect the two lift chains from the base mast.
6. Using a crane with at least one ton of lifting capacity, lift the lower mast section high enough to remove the clamp securing the cylinder to the base, and remove the cylinder from the unit.
7. After maintenance has been performed on the hydraulic cylinder, follow the removal procedure in reverse to reinstall the cylinder in the unit.

Hydraulic Cylinder Repair Procedure

Perform the following procedure to repair and maintain the hydraulic lift cylinder. Refer to Figure 4-6. It is recommended that whenever the hydraulic cylinder is disassembled, all seals be replaced; order seal repair kit B02-13-0097.

1. Remove gland nut (3, Figure 4-6) with gland nut seal (4), rod wiper (2), and o-ring (5) from the cylinder jacket (1).
2. Remove piston rod (6) and wear ring (7). Inspect piston rod (6) for any scratches or pits. Pits that go into the base metal are unacceptable. Scratches that catch the fingernail, but are not through the base metal or less than 1/2 inch long and are around the rod are acceptable providing they are not sharp enough to cut the seal. The rod surface should not have any of the chrome worn through. Replace the cylinder if any of these conditions are not met.
3. Clean inside the cylinder jacket (1) and inspect for any scratches or pits. Pits that are deep enough to catch the fingernail are unacceptable. Scratches that catch the fingernail, but are less than 1/2 inch long and are around the tube are acceptable providing they are not sharp enough to cut the seal. Replace the cylinder if any of these conditions are not met.
4. Install wear ring (7) into the grooves at the bottom of the piston rod (6). Lubricate assembly with hydraulic fluid and place back into cylinder jacket (1).
5. Lubricate rod wiper (2), gland nut seal (4), and o-ring (5) with hydraulic fluid.

6. Twist gland nut seal (4) into a “C” shape and insert it with lip side down into the groove inside the gland nut (3). Place o-ring (5) over the threads of the gland nut (3) and install in groove. Install rod wiper (2) into the top of the gland nut (3).
7. Place gland nut (3) complete with a new gland nut seal (4), rod wiper (2), and o-ring (5) onto the cylinder and tighten down.
8. Reinstall the hydraulic cylinder into the unit and reconnect the hydraulic hose. Refill hydraulic fluid reservoir.
9. Pressurize the cylinder and extend one full stroke to fill it with hydraulic fluid and remove any trapped air.

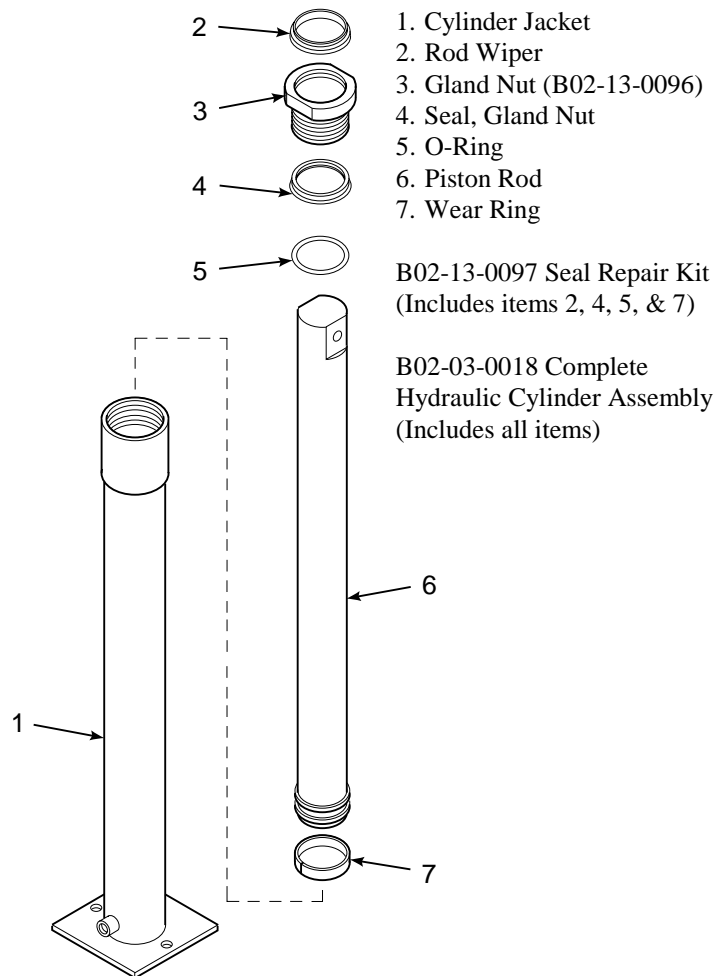


Figure 4-6. Hydraulic Cylinder Exploded View

4-4 ELECTRICAL SYSTEM

Regular maintenance is necessary to keep the electrical system in proper working order. Check daily all electrical wires for cuts, broken wires, potential short circuits, and any other damage.

Battery Care and Charging

The electric system is designed to provide power for a normal work shift. However, the charge life of the battery pack depends on machine usage. Plan your work to prevent unnecessary use of electrical power.

Since the power source for the machine is a battery, proper battery care is important. Recharge the battery after each work shift. When the machine is not being used, batteries should be charged at least once a week. Normal battery charging time should be 10 to 12 hours. If the battery is extremely low, charging time may be as long as 24 hours.

Clean battery terminals monthly. Remove the cables from the battery, clean the battery posts and cable ends to shiny metal, and replace. Always connect the insulated cable from the starter solenoid to the positive post. Lubricate the outside of the connections with petroleum jelly or grease.

Battery Charging Procedure

1. Connect an extension cord from a 110V AC 60 Hz outlet to the flush mount receptacle on the side of the Cougar Lift. The extension cord should be kept as short and as large as possible to reduce voltage drop.
2. When there is power to the battery charger, a red “ON-CHARGING” LED on the charger will be lit and the ammeter will display the rate of charge.
3. Once the battery voltage reaches a predetermined level programmed in the electronic control, the yellow “80% CHARGE” LED will illuminate.
4. 3-1/2 hours after the yellow “80% CHARGE” LED is lit, the charge will be completed and the charger will automatically shut off. All LED’s will be unlit.

NOTE: If the battery voltage does not reach the 80% level within 14 hours, the charger will shut off and the red “CHECK BATTERY” LED will illuminate. This is to avoid prolonged charging of a defective battery that will not properly recharge.



CAUTION

Before making or breaking connections between charger and battery, always remove the power cord from the 110 volt AC outlet. Always check the battery electrolyte level and add water after charging the battery. For more information, refer to the instructions supplied with the battery charger.

5. Unplug the extension cord from the flush mount receptacle on the side of the Cougar Lift.

4-5 LIFT CHAINS AND SLIDE BLOCKS

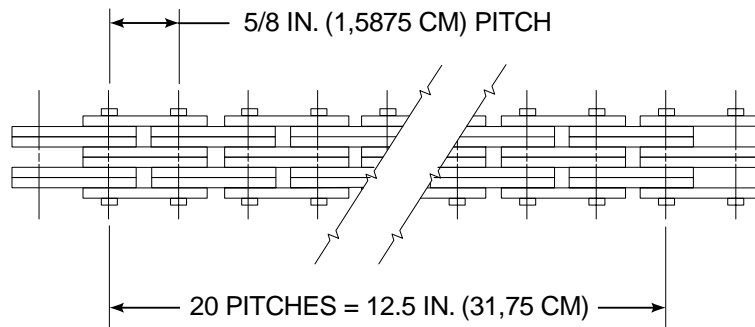
⚠ WARNING

Do not operate a unit on which any chain assembly is damaged or in need of replacement. Operating a unit with a damaged chain can cause severe injury or death to personnel and damage to equipment.

Inspect all lift chains daily. Inspect for signs of wear, split leaves, loose pins, clevis damage, and elongation. Replace any chain which is damaged in any way. Chain assemblies may be ordered from your dealer or direct from the factory. Do not operate a unit on which any chain assembly is damaged and in need of replacement.

Chain Elongation Inspection

One pitch of chain should measure 5/8 in. (1,5875 cm). Measure 20 pitches of chain. The ideal measurement for 20 pitches of chain should be 12.5 in. (31,75 cm). Replace the chain if 20 pitches measure over 12.75 in. (32,385 cm). Refer to Figure 4-7.



**REPLACE CHAIN IF 20 PITCHES MEASURES
OVER 12.75 IN (32,385 CM)**

Figure 4-7. Chain Elongation Inspection

NOTE: It is recommended that chains be replaced every four years unless damage or wear requires replacement at a lesser interval.

Lift Chain Adjustment

1. Raise the platform to the maximum extended height and then lower it while someone checks to see that all sheaves are turning and checks for chain damage or wear.
2. After the platform is completely lowered, remove the plexiglass cover from the base.
3. Chains should be tight to the touch with no loose play. Check all four lift chains for snugness. If a chain is loose, tighten the lock nut below the clevis retainer. Refer to Figure 4-8. Adjust any loose chain until it just becomes snug. Do not overtighten any chain so that the platform is raised from its resting position.
4. Make sure the lock nuts are turned onto the threaded clevis ends with at least 1/8 in. of the clevis end extending through the nut. Replace any lock nut which does not stay in position during use. Replace the plexiglass cover.

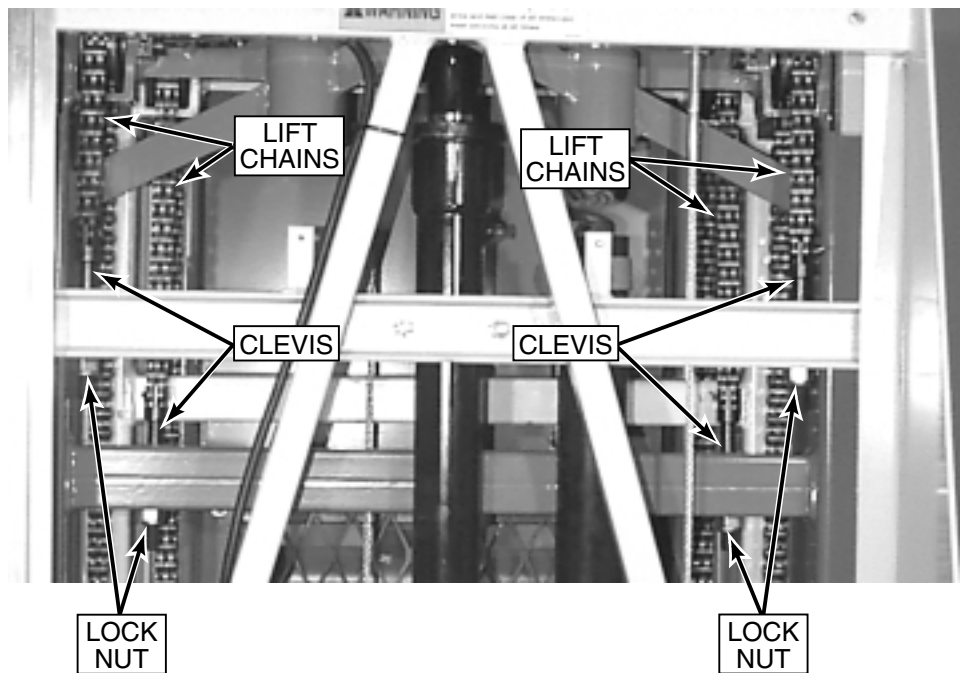


Figure 4-8. Lift Chain Adjustment

Slide Block Adjustment

Annually check for wear on the slide blocks and replace or retighten as necessary. If the lift exhibits excessive mast sway, it is probable that the slide blocks need adjustment. The slide blocks should be adjusted so that there is no air gap between the slide block and the mast the slide block is moving against. There are 12 slide blocks, 6 upper and 6 lower. The adjustment procedure is the same for all slide blocks. Three upper slide blocks are shown in Figure 4-9.

1. Loosen, do not remove, the slotted hex head screw securing the slide block to be adjusted.
2. Using an allen wrench, turn the set screws in (clockwise). This will push the block in against the next mast. Do not overtighten. Tighten the slotted hex head screw to secure the slide block in position.
3. Check all slide blocks and make adjustments as necessary.
4. After all adjustments are made, fully extend the lift. If the platform can be lowered without stopping then the blocks are properly adjusted.

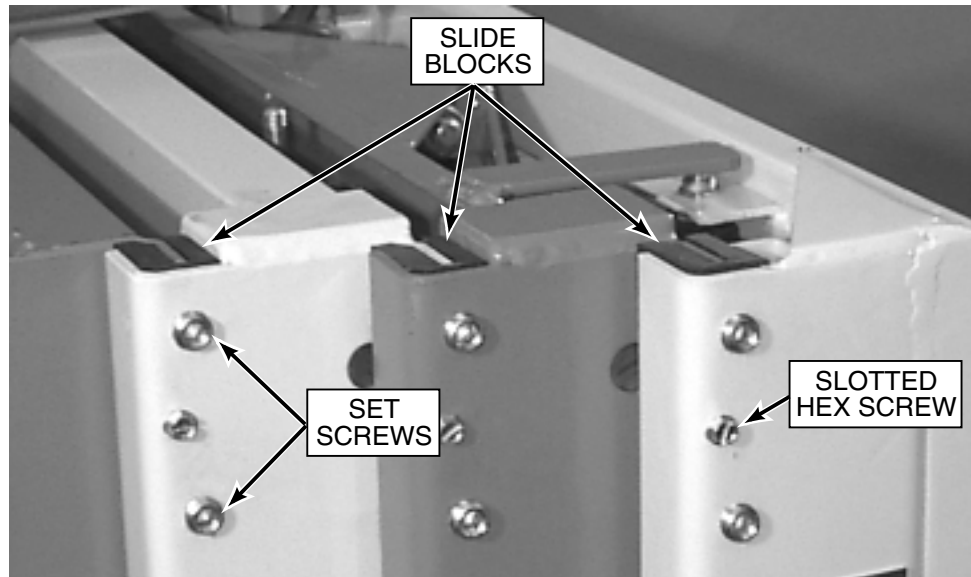


Figure 4-9. Slide Block Adjustment

NOTE: The plastic slide blocks in the mast are made of a bearing material which has a high degree of lubricity and need only be kept clean. However, precautions should be taken to ensure that the paths along which the blocks move are kept clean and lightly lubricated with a dry type silicon lubricant.

4-6 TROUBLESHOOTING

Table 4-3. Troubleshooting Chart

Problem	Cause	Correction
1. Green WHEEL UP/BASE SET button will not light.	a. Base not firmly set on foot pads. b. *Low voltage. c. Burned out bulb. d. Lift is out of level. e. Broken or loose wire. f. Two parts of battery connector plug not mated together.	a. Depress WHEEL UP/BASE SET button raising front casters. This allows lift to firmly set on foot pads. b. Recharge battery or replace if damaged. c. Replace bulb. d. Level lift with two adjusting foot pads or relocate lift to level surface. e. Repair or replace wire. f. Mate battery connector plug parts together.
2. When UP switch is selected, motor runs but unit will not lift a load.	a. More than 500 lbs. on platform. b. N.O. (Normally Open) valve is not being energized. c. Emergency lowering valve is open. d. Mast sections are dirty.	a. Ensure load is 500 lbs. or less. b. Check voltage at N.O. valve. If no voltage, check for loose or broken wire. If voltage, ensure at least 9 volts for start solenoid operation. Check battery and start solenoid. Repair or replace as needed. c. Close emergency lowering valve. d. Clean and lubricate masts with dry silicone.
3. Masts have excessive sway when fully extended.	a. Plastic slide blocks are out of adjustment.	a. Refer to Slide Block Adjustment in section 4-5.

*NOTE: Smart start solenoid will not engage if battery charge drops below 9 volts.

Table 4-3. Troubleshooting Chart, Continued

Problem	Cause	Correction
4. Pump/motor will not run when UP is selected.	a. EMERGENCY STOP button is activated (pushed in). b. Green WHEEL UP/BASE SET button is not lit. c. Motor start relay is not activating. d. Motor start relay is activating, but motor does not run. e. *Low voltage.	a. Turn EMERGENCY STOP button counterclockwise to de-activate. b. Refer to Problem 1. c. Check voltage at white wire on motor start relay. If voltage, replace defective motor start relay. If no voltage, check for loose or broken wire. Repair or replace wire. d. Check hydraulic gear pump for seizure. If seized, replace pump. If not, check motor. Motor may need replacement. e. Recharge or replace the battery.
5. When two parts of battery connector plug are mated together, the motor runs without UP switch being selected.	a. Short in electrical system. b. Motor start relay is stuck in "on" position.	a. Repair or replace any loose or broken wires. b. Replace defective motor start relay.
6. Hydraulic cylinder leaks at gland nut.	a. Loose gland nut. b. Defective seals.	a. Tighten gland nut. b. Replace seals in hydraulic cylinder. Refer to Hydraulic Cylinder Repair, in section 4-3.

*NOTE: Smart start solenoid will not engage if battery charge drops below 9 volts.

5

Replacement Decals

Refer to Table 5-1, and Figures 5-1, 5-2, and 5-3 for descriptions and locations of decals on the Cougar Lift.

Table 5-1. Replacement Decals

Decal No.	Description of Decal	Qty
B06-00-0003	Bil-Jax ID Number (Not available as replacement part)	1
B06-00-0009	Warning...Moving telescopic masts will create...	2
B06-00-0034	Danger...During charging, explosive oxyhydrogen gas...	1
B06-00-0106	XLT-1571 (Transfer type decal)	2
B06-00-0138	Warning...(Maintenance decal)	1
B06-00-0146	Danger...(High voltage line warning)	1
B06-00-0167	Striped Safety Tape - On all four sides (per roll only)	4
B06-00-0170	Maximum Capacity...500 lb. Or...	2
B06-00-0173	Safety Belt Lanyard Attachment Point	2
B06-00-0175	Caution...This machine designed and manufactured...	1
B06-00-0192	Operation And Service Manual Inside	1
B06-00-0225	Warning...Stay clear when raising or lowering	2
B06-00-0228	Serial Number Tag (Not available as replacement part)	1
B06-00-0289	Check level with cage fully down	1
B06-00-0291	Warning...Level machine before use	1
B06-00-0295	Danger...Failure To Comply With The Following...	1
B06-00-0296	Battery Charger Receptacle	1
B06-00-0306	Warning...Stand clear when lowering lift onto the foot pads...	2
B06-00-0339	Warning...Full Body Harness and Lanyard...	1
B06-00-0339BLT	Warning...Body Belt and Lanyard...	1
B06-00-0286	Emergency Lowering	1
B06-00-0349	Operation Instructions for Battery Charger	1
B06-00-0350	Operation Instructions for Stockpickers	1
B06-00-0455	Bil-Jax (Vertical transfer type decal)	2

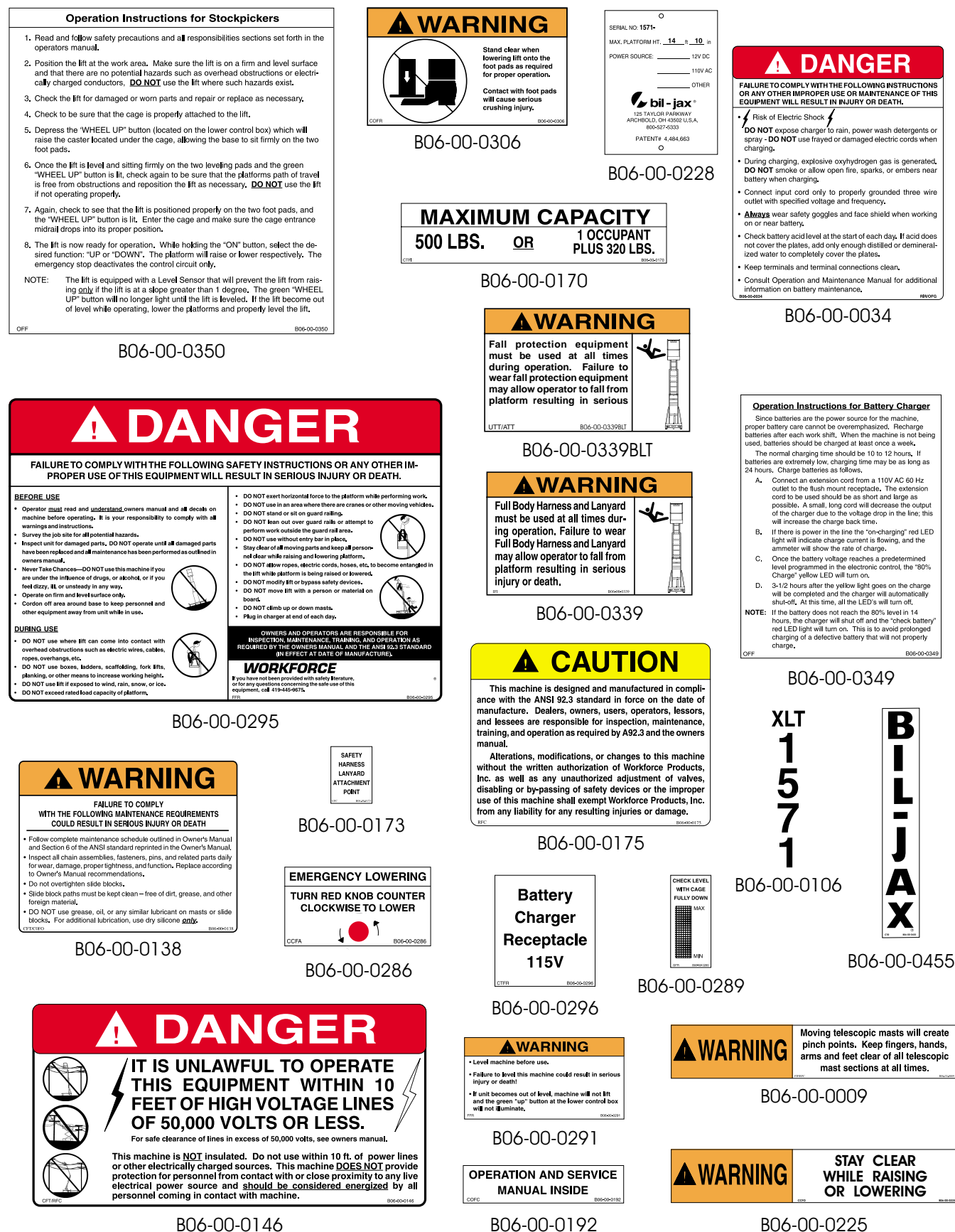


Figure 5-1. Replacement Decals

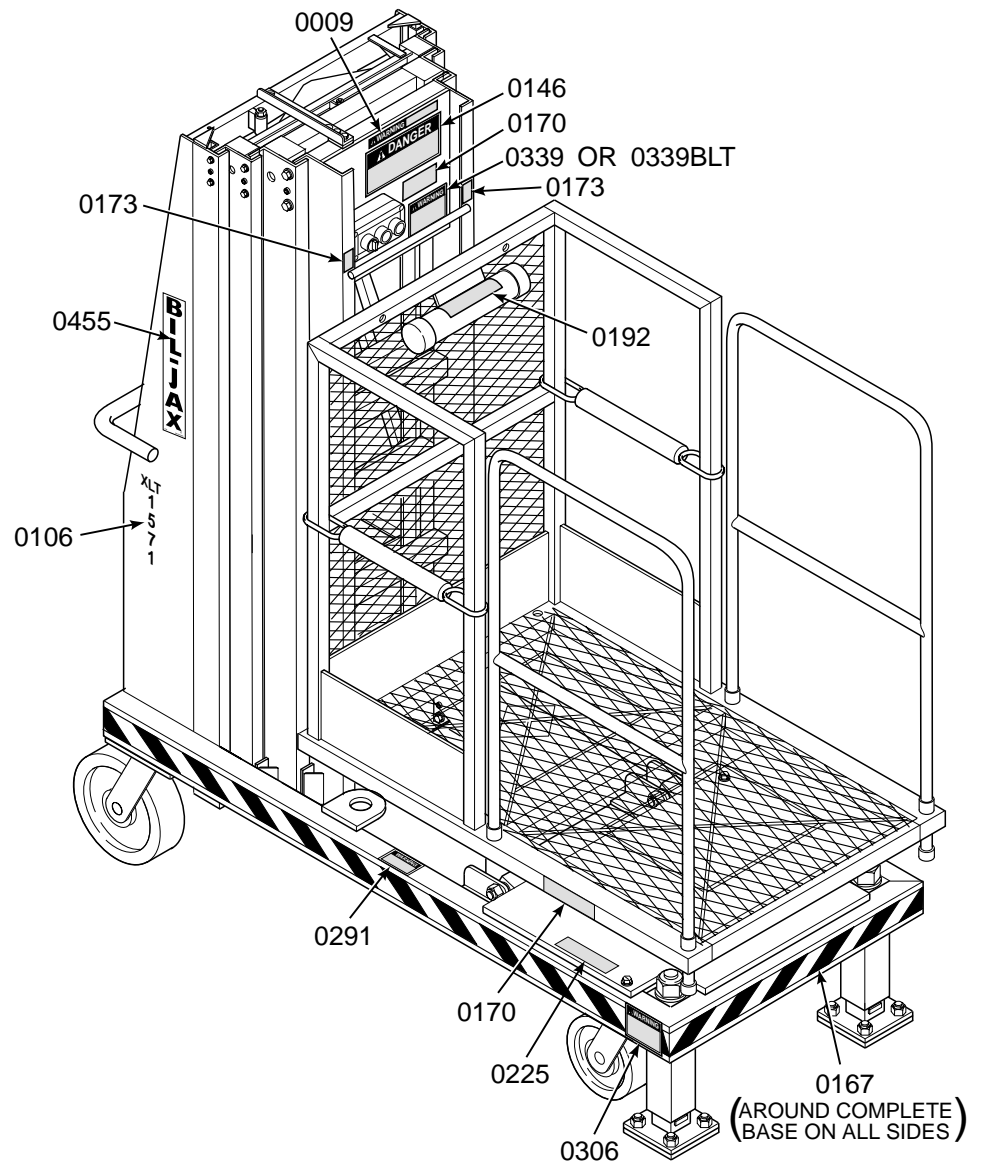


Figure 5-2. Decal Locations, Side View

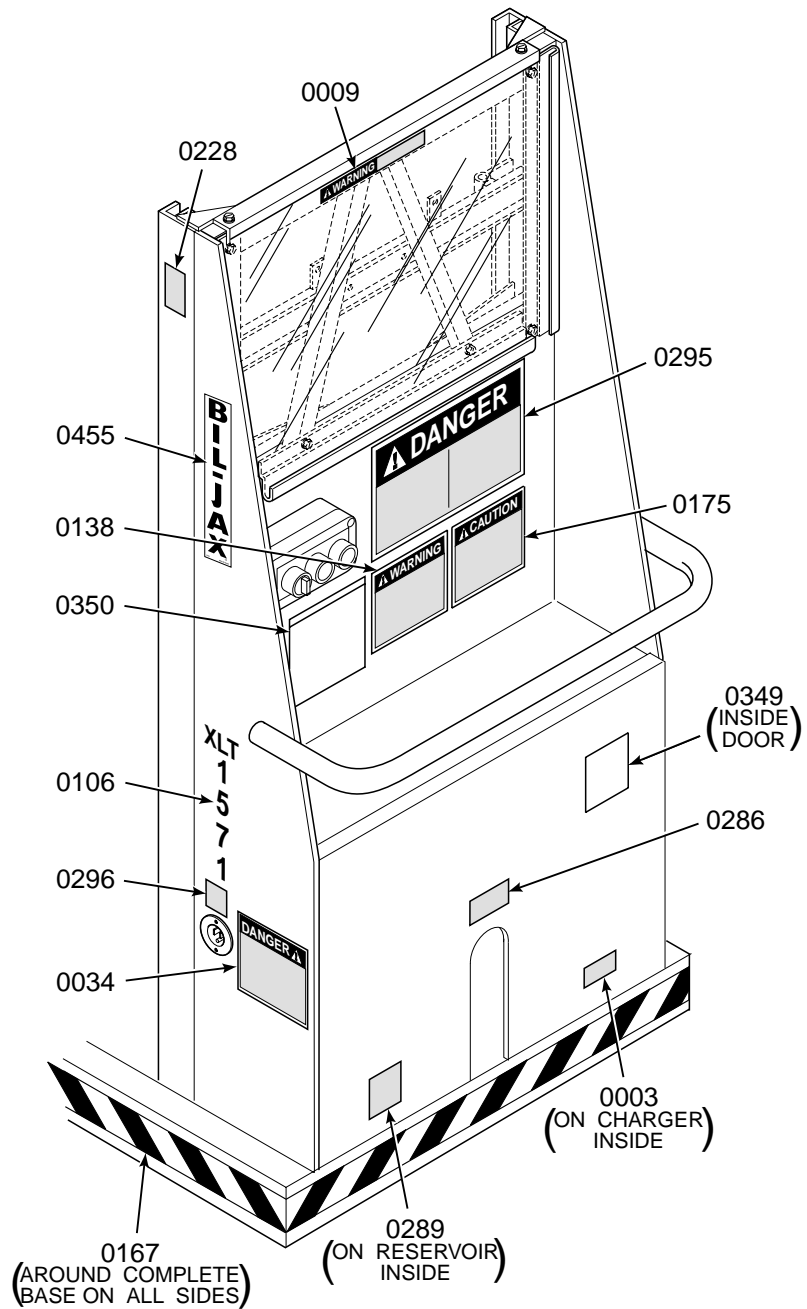


Figure 5-3. Decal Locations, Front View

6

Parts List

6-1 TOP MAST PARTS LIST

Refer to Table 6-1 for the parts list for the top mast.

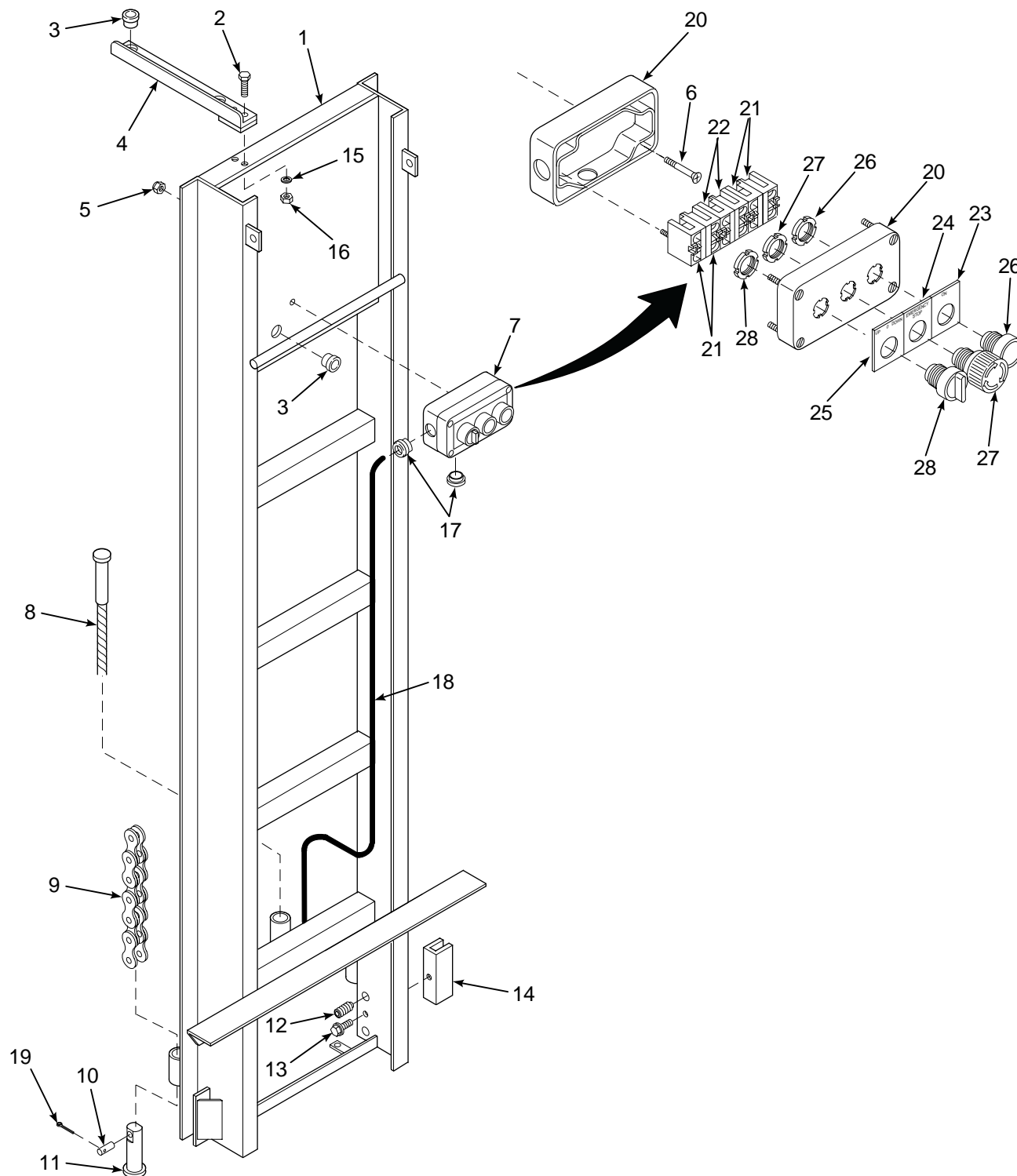


Figure 6-1. Top Mast Exploded View

Table 6-1. Top Mast Parts List

Item No.	Part No.	Description	Qty
1	B16-01-0024	Top Mast Weldment	1
2	0090-0014	Screw, 1/4-20 x 2-1/4 in.	2
3	B01-09-0026	Grommet, Plastic	3
4	B29-00-0076	Bracket, Outreach	1
5	0090-0181	Nut, Lock, 8-32	3
6	0090-0813	Screw, 8-32 x 3/4 in.	3
7	B01-02-0059	Box, Control, Upper	1
8	B40-00-0003	Cable, 3/16 in.	1
9	B40-01-0008	Chain, Lift	2
10	B04-07-0078	Pin, Clevis	2
11	B04-07-0087	Clevis, Lower	2
12	0090-0389	Screw, Adjustment, 1/2-20 x 1/2 in.	4
13	0090-0403	Screw, #10 x 1 in.	2
14	B31-00-0001	Slide Block, Plastic	2
15	0090-0206	Washer, Lock, 1/4 in.	2
16	0090-0159	Nut, Hex, 1/4-20	2
17	B01-09-0029	Bushing, Strain Relief	2
18	B05-01-0034	Cable, SJO, 18-2	80 in.
19	0090-0860	Pin, Cotter	2
20	B19-00-0001	Box Only, 3-Position	1
21	B01-02-0005	Contact, NO	4
22	B01-02-0006	Contact, NC	2
23	B00-00-0015	Plate, ON	1
24	B00-00-0017	Plate, Stop, Emergency	1
25	B00-00-0016	Plate, Up/Down	1
26	B01-02-0003	Button, Push, Flush	1
27	B01-02-0004	Button, Stop, Emergency	1
28	B01-02-0025	Switch, Selector	1
*	B03-00-0009	Chain Assy, includes items 9, 10, 11, and 19	1

*NOTE: It is recommended that chain parts be purchased as an assembly.

6-2 CENTER MAST PARTS LIST

Refer to Table 6-2 for the parts list for the center mast.

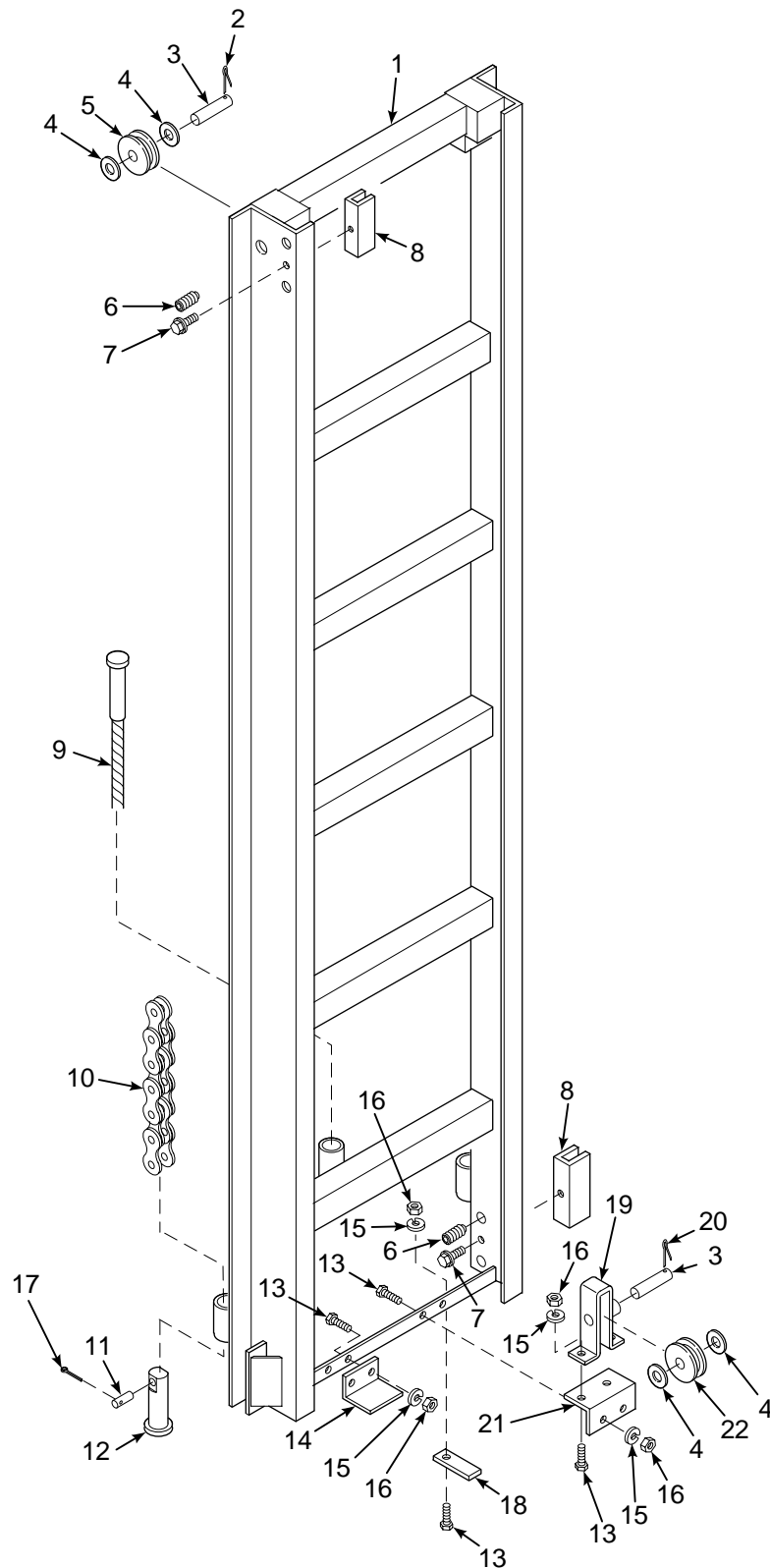


Figure 6-2. Center Mast Exploded View

Table 6-2. Center Mast Parts List

Item No.	Part No.	Description	Qty
1	B16-01-0020	Center Mast Weldment	1
2	0090-0770	Pin, Cotter 3/16 x 1-1/2 in.	2
3	B36-01-0002	Sheave Axle	3
4	0090-0425	Washer, 5/8 in.	6
5	B26-00-0009	Chain Sheave Assembly	2
6	0090-0389	Screw, Adjustment, 1/2-20 x 1/2 in.	8
7	0090-0403	Screw, #10 x 1 in.	4
8	B31-00-0001	Slide Block, Plastic	4
9	B40-00-0003	Cable, 3/16 in.	1
10	B40-01-0008	Chain, Lift	2
11	B40-07-0078	Pin, Clevis	2
12	B04-07-0087	Clevis, Lower	2
13	0090-0042	Bolt, 3/8-16 x 1 in.	7
14	B29-00-0033	Mast Stop	1
15	0090-0210	Washer, Lock, 3/8 in.	7
16	0090-0162	Nut, 3/8-16	7
17	0090-0860	Pin, Cotter	1
18	0064-0363	Actuator, Limit Switch	1
19	B29-00-0078	Bracket, Weldment	1
20	0090-0147	Pin, Cotter	1
21	B24-01-0008	Mounting Bracket	1
22	B26-00-0001	Sheave, Cable	1
*	B03-00-0009	Chain Assy, includes items 10, 11, 12, and 17	1

*NOTE: It is recommended that chain parts be purchased as an assembly.

6-3 LOWER MAST PARTS LIST

Refer to Table 6-3 for the parts list for the lower mast.

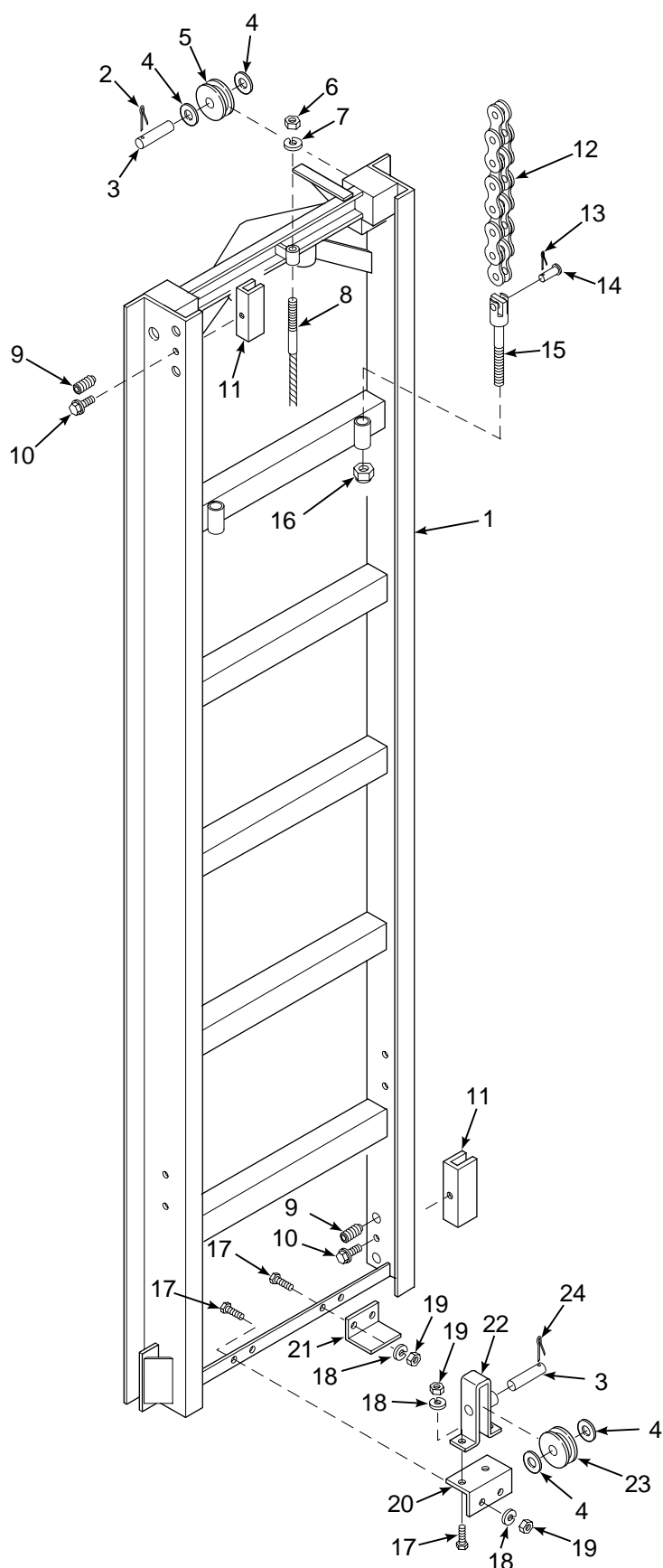


Figure 6-3. Lower Mast Exploded View

Table 6-3. Lower Mast Parts List

Item No.	Part No.	Description	Qty
1	B16-01-0021	Lower Mast Weldment	1
2	0090-0770	Pin, Cotter 3/16 x 1-1/2 in.	2
3	B36-01-0002	Sheave Axle	3
4	0090-0425	Washer, Flat, 5/8 in.	6
5	B26-00-0009	Chain Sheave Assembly	2
6	0090-0188	Nut, Lock, 3/8-16	1
7	0090-0422	Washer, Flat, 3/8	1
8	B40-00-0003	Cable	1
9	0090-0389	Screw, Adjustment, 1/2-20 x 1/2 in.	8
10	0090-0403	Screw, #10 x 1	4
11	B31-00-0001	Slide Block, Plastic	4
12	B40-01-0008	Chain, Lift	2
13	0090-0860	Pin, Cotter	2
14	B04-07-0078	Pin, Clevis	2
15	B04-07-0088	Clevis, Upper	2
16	0090-0192	Nut, Lock, 1/2-13	2
17	0090-0042	Bolt, 3/8-16 x 1 in.	6
18	0090-0210	Washer, Lock, 3/8 in.	6
19	0090-0162	Nut, 3/8-16	6
20	B24-01-0008	Mounting Bracket	1
21	B29-00-0033	Mast Stop	1
22	B29-00-0078	Bracket, Weldment	1
23	B26-00-0001	Sheave, Cable	1
24	0090-0147	Pin, Cotter	1
*	B03-00-0009	Chain Assy, includes items 12, 13, 14, and 15	1

*NOTE: It is recommended that chain parts be purchased as an assembly.

6-4 BATTERY COMPARTMENT PARTS LIST

Refer to Table 6-4 for the parts list for the battery compartment.

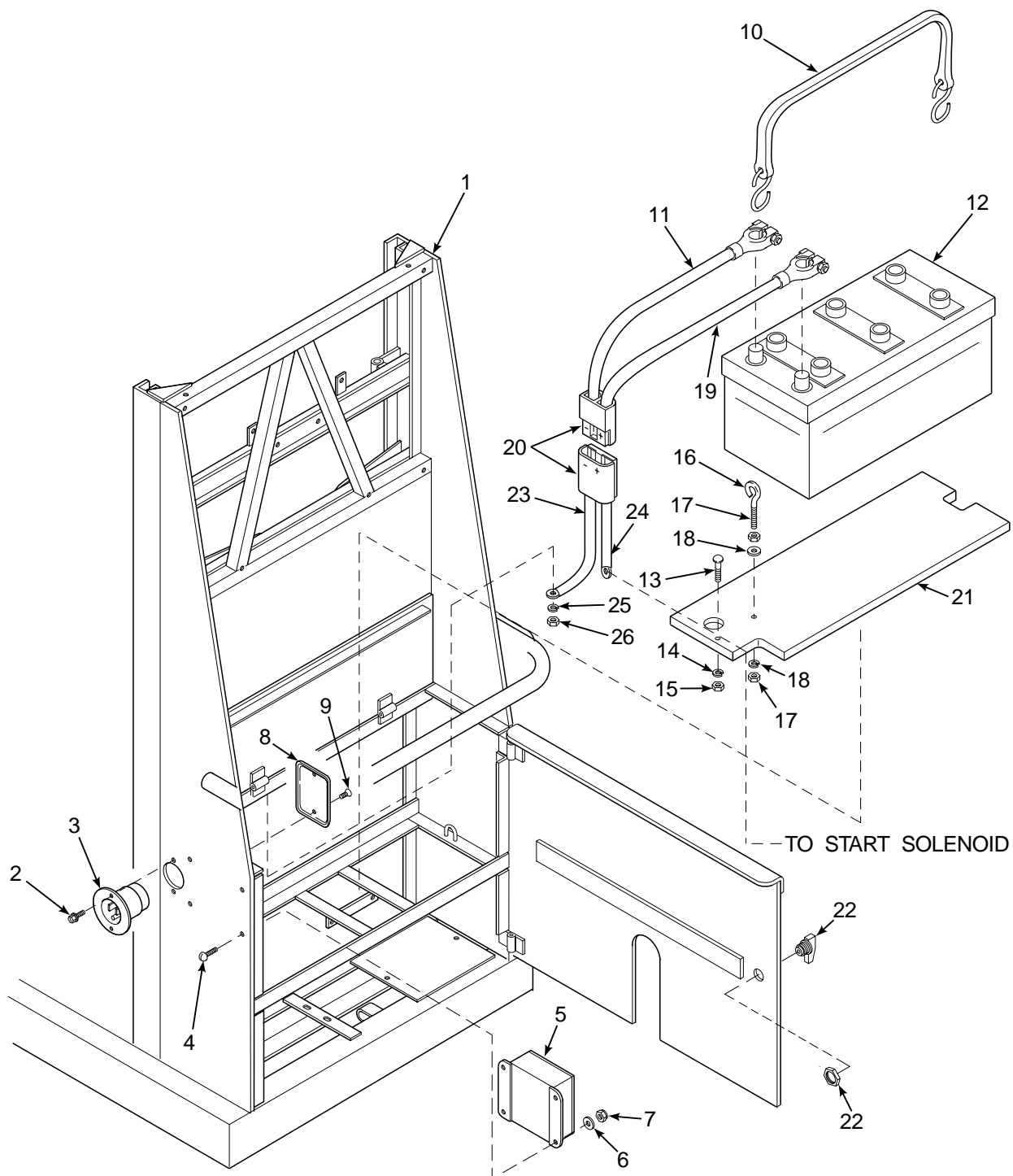


Table 6-4. Battery Compartment Parts List

Item No.	Part No.	Description	Qty
1	B11-01-0076	Base Weldment	1
2	0090-0344	Screw, Threadcut, 10-24 x 1/2 in.	2
3	B01-10-0003	Receptacle, Flush Mount	1
4	0090-0813	Screw, 8-32 x 3/4 in.	4
5	B19-00-0022	Box, Black, TomCat	1
6	0090-0415	Washer, Flat, #10	4
7	0090-0181	Nut, Lock, 8-32	4
8	B18-00-0026	Cover, (with screws)	1
9	(part of 8)	Screw	2
10	B00-00-0048	Strap, Rubber	1
11	B01-01-0115	Cable, Battery, 16 in., Black	1
12	B01-04-0008	Battery, 12 Volt	1
13	0090-0125	Bolt, Carriage, 1/4-20 x 1-1/4 in.	1
14	0090-0206	Washer, Lock, 1/4 in.	1
15	0090-0159	Nut, 1/4-20	1
16	0090-0669	Bolt, Eye, 5/16-18 x 2 in.	1
17	0090-0160	Nut, 5/16-18	2
18	0090-0420	Washer, 5/16	2
19	B01-01-0116	Cable, Battery, 16 in., Red	1
20	B01-09-0031	Plug, Connector	2
21	B44-00-0002	Board, Battery	1
22	B37-00-0006	Lock Assy., Utility	1
23	B01-01-0038	Cable, Battery, 22 in., Black	1
24	B01-01-0036	Cable, Battery, 33 in., Red	1
25	0090-0210	Washer, Lock, 3/8 in.	1
26	0090-0126	Nut, Hex, 3/8-16	1

6-5 HYDRAULIC PUMP COMPARTMENT PARTS LIST

Refer to Table 6-5 for the parts list for the hydraulic pump compartment.

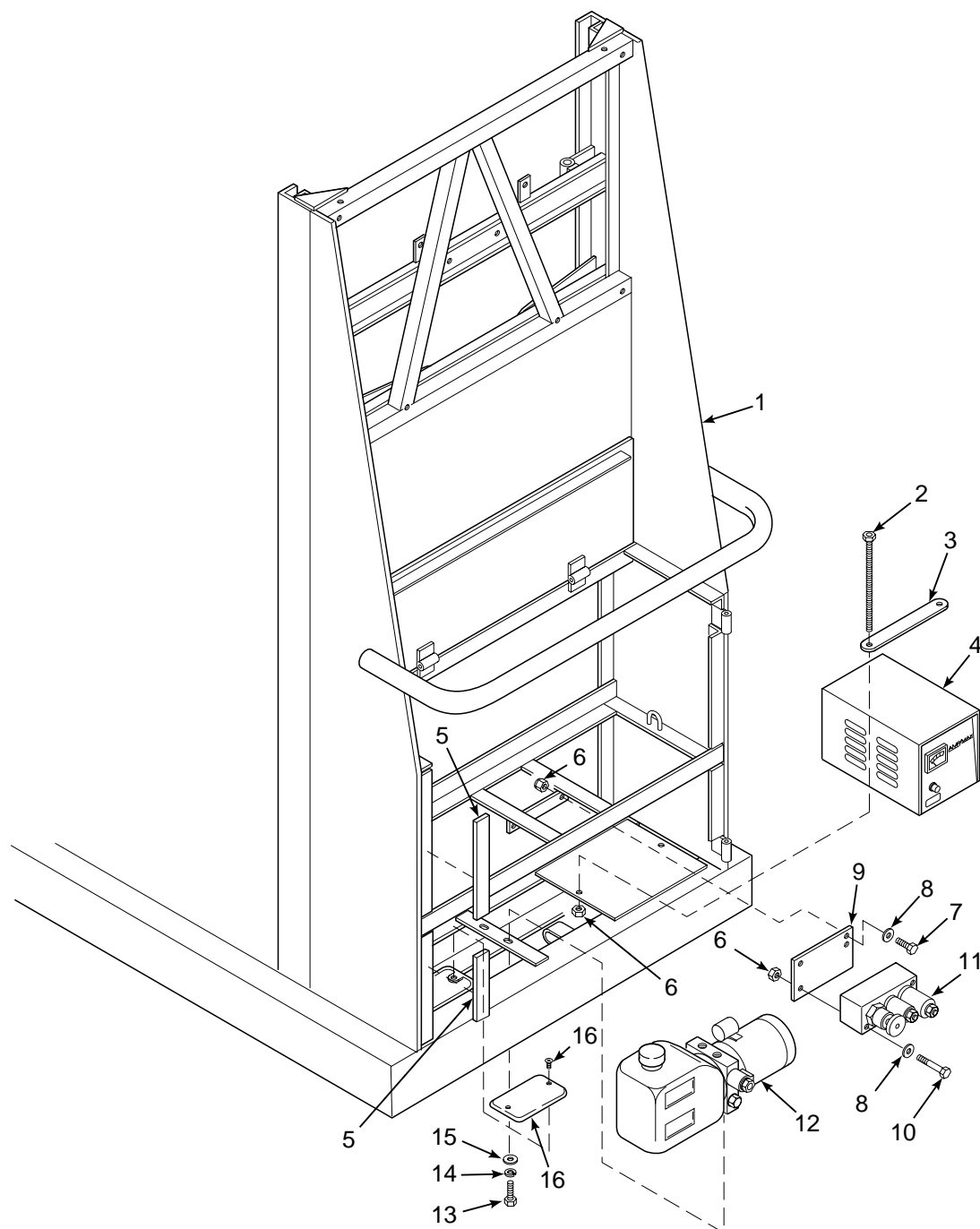


Figure 6-5. Hydraulic Pump Compartment Exploded View

Table 6-5. Hydraulic Pump Compartment Parts List

Item No.	Part No.	Description	Qty
1	B11-01-0076	Base Weldment	1
2	B04-07-0093	Rod, Hold Down, Weldment	2
3	B07-06-5119	Strap, Hold Down	1
4	B01-05-0039	Charger, Battery	1
5	B05-00-0006	Tape, Foam Adhesive	2 ft.
6	0090-0183	Nut, Lock, 1/4-20	6
7	0090-0005	Bolt, 1/4-20 x 3/4	2
8	0090-0419	Washer, Flat, 1/4 in.	4
9	B29-00-0116	Bracket, Hydraulic Valve	1
10	0090-0014	Bolt, 1/4-20 x 2-1/2 in.	2
11	B02-04-0047	Valve, Combination	1
12	B02-05-0024	Pump, Hydraulic	1
13	0090-0040	Bolt, 3/8-16 x 3/4 in.	2
14	0090-0210	Washer, Lock	2
15	0090-0422	Washer, Flat	2
16	B18-00-0026	Cover, (with 2 screws)	1

6-6 UPPER BASE PARTS LIST

Refer to Table 6-6 for the parts list for the upper base.

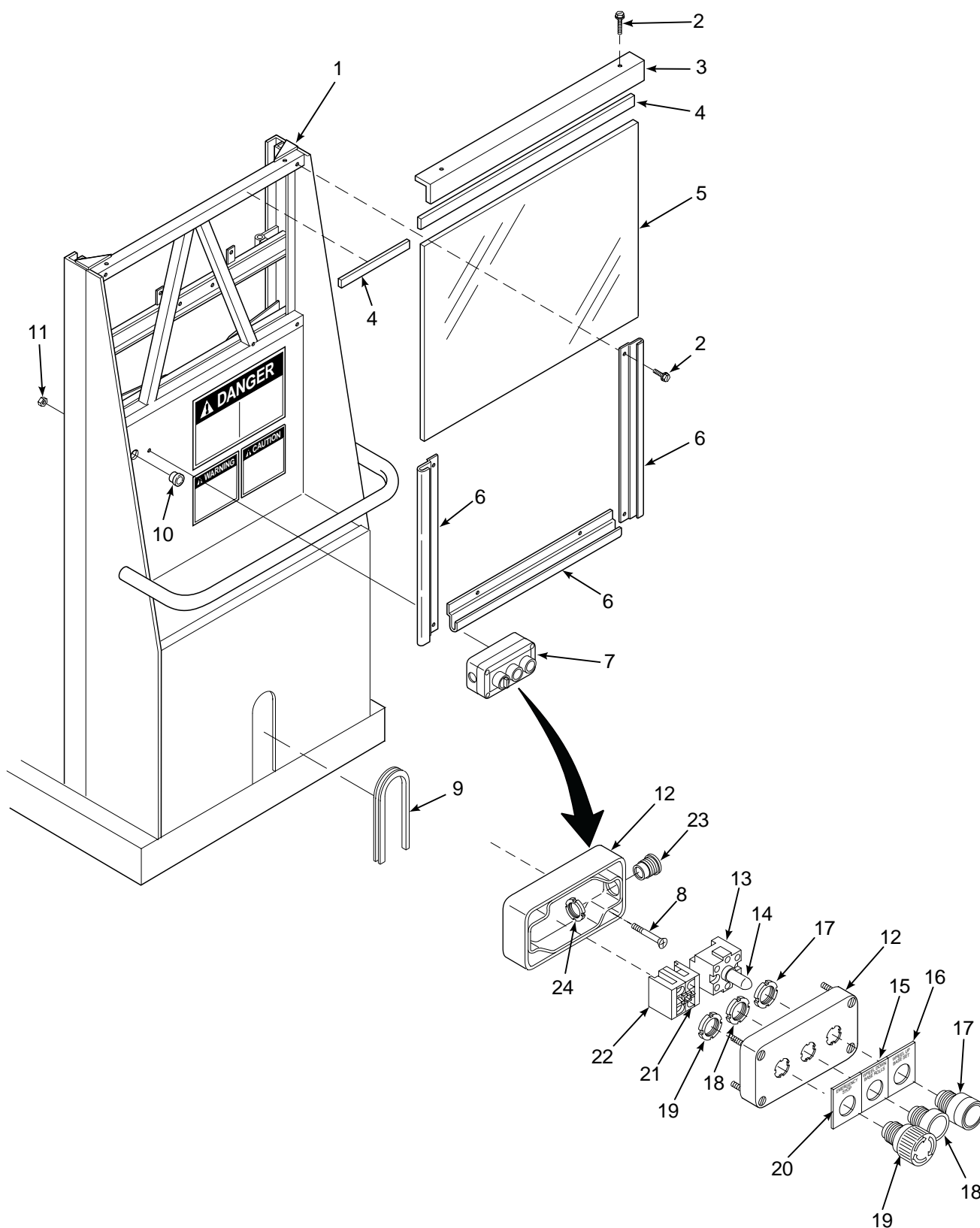


Figure 6-6. Upper Base Exploded View

Table 6-6. Upper Base Parts List

Item No.	Part No.	Description	Qty
1	B11-01-0076	Base Weldment	1
2	0090-0344	Screw, Threadcut, 10-24 x 1/2 in.	8
3	B07-01-2003	Edge, Top Cover	1
4	B05-00-0006	Tape, Foam Adhesive	32 in.
5	B18-00-0108	Plexiglass, 1/8 in.	1
6	B24-01-009	Frame, Aluminum	3
7	B01-02-0058	Box, Control, Lower	1
8	0090-0813	Screw, 8-32 x 3/4 in.	2
9	B34-00-0005	Trim, Rubber	1
10	B01-09-0027	Grommet, Plastic	1
11	0090-0181	Nut, Lock, 8-32	2
12	B19-00-0001	Box Only, 3-Position	1
13	B01-02-0029	Socket, Light, Contact with	1
14	B01-10-0042	Light Bulb, 12v	1
15	B00-00-0091	Plate, Wheel Down	1
16	B00-00-0092	Plate, Wheel Up	1
17	B01-02-0028	Button, Push, Lighted	1
18	B01-02-0003	Button, Push, Flush	1
19	B01-02-0004	Button, Stop, Emergency	1
20	B00-00-0017	Plate, Stop, Emergency	1
21	B01-02-0005	Contact, NO	1
22	B01-02-0006	Contact, NC	1
23	B01-10-0001	Receptacle, Female, 3-Wire	1
24	B04-07-0012	Nut, Elec. Drive, 1/2"	1

6-7 BASE MAST PARTS LIST

Refer to Table 6-7 for the parts list for the base mast.

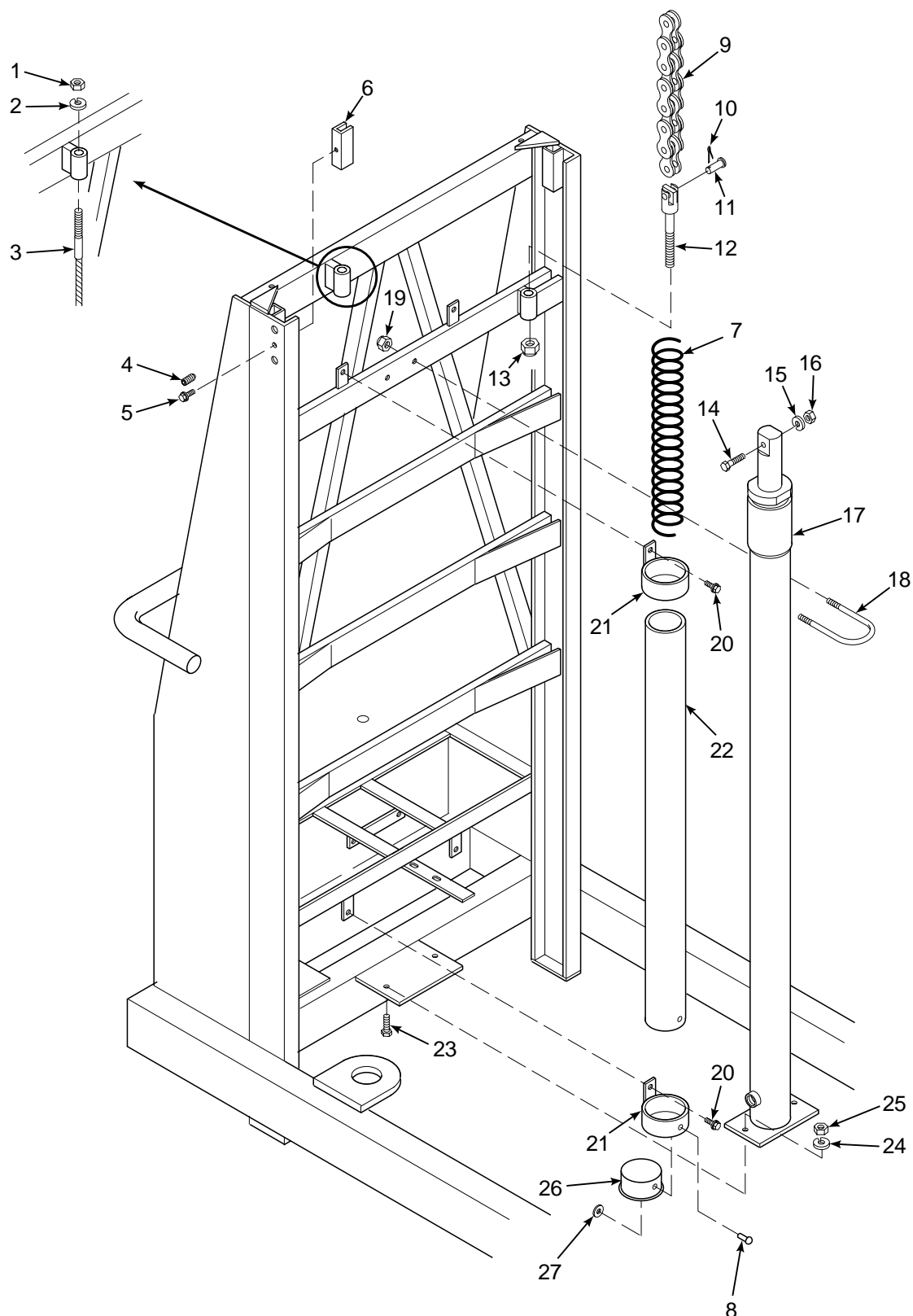


Figure 6-7. Base Mast Exploded View

Table 6-7. Base Mast Parts List

Item No.	Part No.	Description	Qty
1	0090-0188	Nut, Lock, 3/8-16	1
2	0090-0422	Washer, Flat, 3/8 in.	1
3	B40-00-0003	Cable	1
4	0090-0389	Screw, Adjustment, 1/2-20 x 1/2 in.	4
5	0090-0403	Screw, #10 x 1 in.	2
6	B31-00-0001	Slide Block, Plastic	2
7	B01-01-0046	Cord, Retractable	1
8	0090-0684	Rivet, Pop, 3/16 x 1/2 in.	2
9	B40-01-0008	Chain, Lift	2
10	0090-0860	Pin, Cotter, 1.6 mm	2
11	B04-07-0078	Pin, Clevis	2
12	B04-07-0088	Clevis, Upper	2
13	0090-0192	Nut, Lock, 1/2-13	2
14	0090-0071	Bolt, 1/2-13 X 2-1/2 in.	1
15	0090-0212	Washer, Lock, 1/2 in.	1
16	0090-0166	Nut, Hex, 1/2-13	1
17	B02-03-0018	Cylinder, Hydraulic Lift, 1.5 in. Diameter	1
18	0090-0654	Clamp, U-bolt, 5/16-18 x 2-1/2 x 2-5/8	1
19	0090-0185	Nut, Lock, 5/16-18	2
20	0090-0344	Screw, Threadcut, 10-24 x 1/2	2
21	B29-00-0049	Retainer, Tube	2
22	B00-00-0007	Tube, Plastic	1
23	0090-0043	Bolt, 3/8-16 x 1-1/4	2
24	0090-0219	Washer, Lock, 3/8	2
25	0090-0162	Nut, Hex, 3/8-16	2
26	B00-00-0008	Plug, Plastic	1
27	0090-0498	Washer, Flat, 3/16 in.	2
*	B03-00-0009	Chain Assy, includes items 9, 10, 11, and 12	1

*NOTE: It is recommended that chain parts be purchased as an assembly.

6-8 LOWER BASE PARTS LIST

Refer to Table 6-8 for the parts list for the lower base.

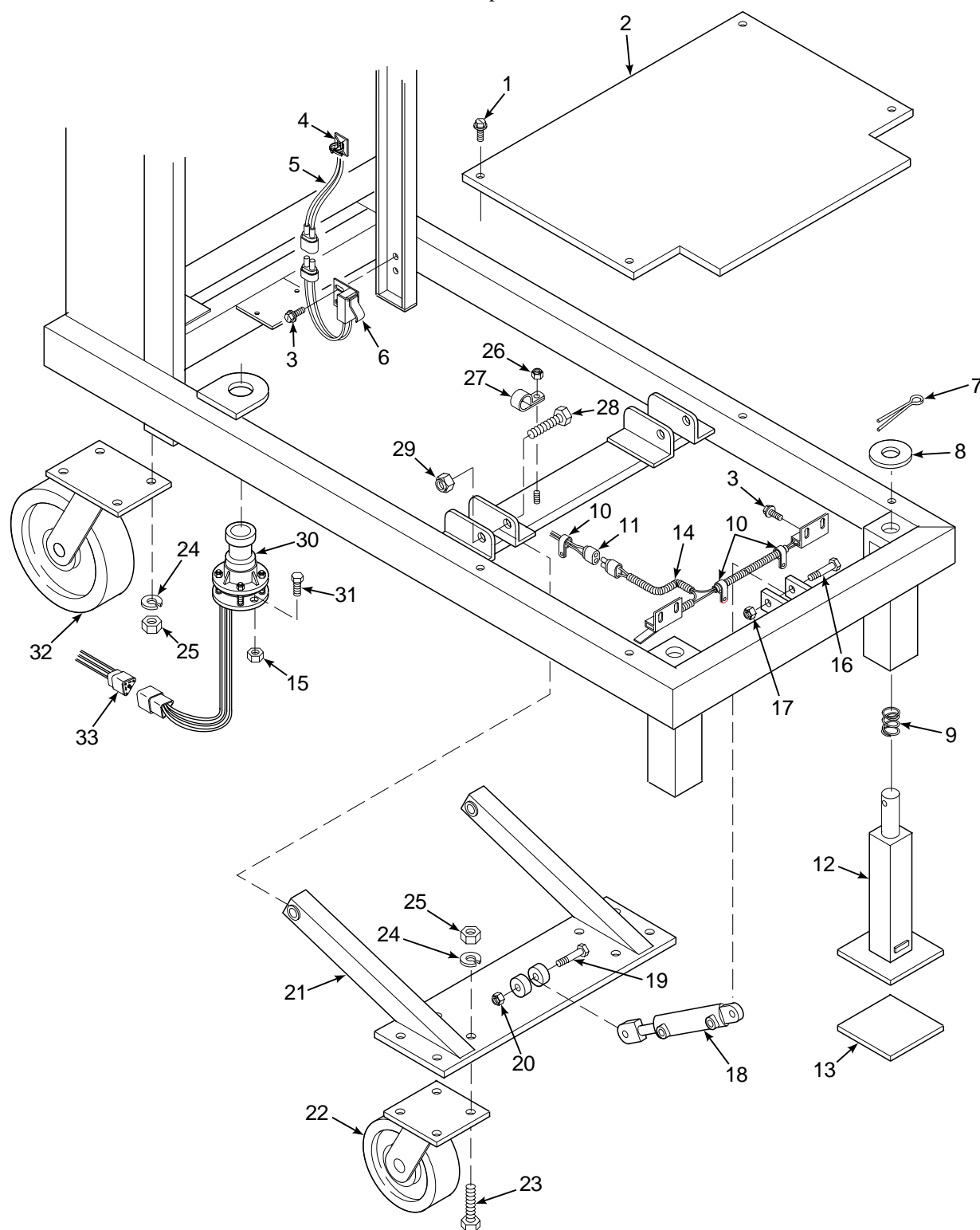


Figure 6-8. Lower Base Exploded View

Table 6-8. Lower Base Parts List

Item No.	Part No.	Description	Qty
1	0090-0344	Screw, Threadcut, 10-24 x 1/2 in.	4
2	B18-00-0107	Cover	1
3	0090-0344	Screw, Threadcut, 10-24 x 1/2 in.	6
4	B04-07-0015	Clamp, Cable	2
5	B01-01-0123	Cable Assembly, Mast Switch	1
6	B01-03-0040	Switch, Limit, Mast	1
7	0090-0770	Pin, Cotter	2
8	0090-0195	Washer, Flat, 3/4 in.	2
9	B39-00-0027	Spring	2
10	B04-07-0032	Clamp, Cable, DG-6	3
11	B01-01-0122	Cable Assembly, Foot Switch	1
12	B11-01-0085	Foot, Inner	2
13	B23-02-0034	Foot, Pad	2
14	B01-03-0039	Foot Switch Assembly	1
15	0090-0183	Nut, Lock, 1/4-20	2
16	0090-0049	Bolt, 3/8-16 x 2-1/4 in.	1
17	0090-0188	Nut, Lock, 3/8-16	1
18	B02-03-0010	Cylinder, Hydraulic Wheel	1
19	0090-0054	Bolt, 3/8-16 x 3-1/2 in.	1
20	0090-0188	Nut, Lock, 3/8-16	1
21	B11-01-0073	Arm Weldment, Hydraulic Cylinder	1
22	B08-01-0019	Caster, Rigid, 6 in.	2
23	0090-0042	Bolt, 3/8-16 x 1 in.	8
24	0090-0210	Washer, Lock, 3/8 in.	16
25	0090-0162	Nut, Hex, 3/8-16	16
26	0090-0183	Nut, Lock, 1/4-20	3
27	B04-07-0035	Clamp, Cable, DG-14	3
28	0090-0463	Bolt, 1/2-13 x 4 in.	2
29	0090-0192	Nut, Lock, 1/2-13	2
30	B01-10-0135	Sensor, Level	1
31	0090-0005	Bolt, 1/4-20 x 3/4	2
32	B08-01-0002	Caster, 8 in.	2
33	B01-01-0113	Plug, Level Sensor	1

6-9 PLATFORM PARTS LIST

Refer to Table 6-9 for the parts list for the platform.

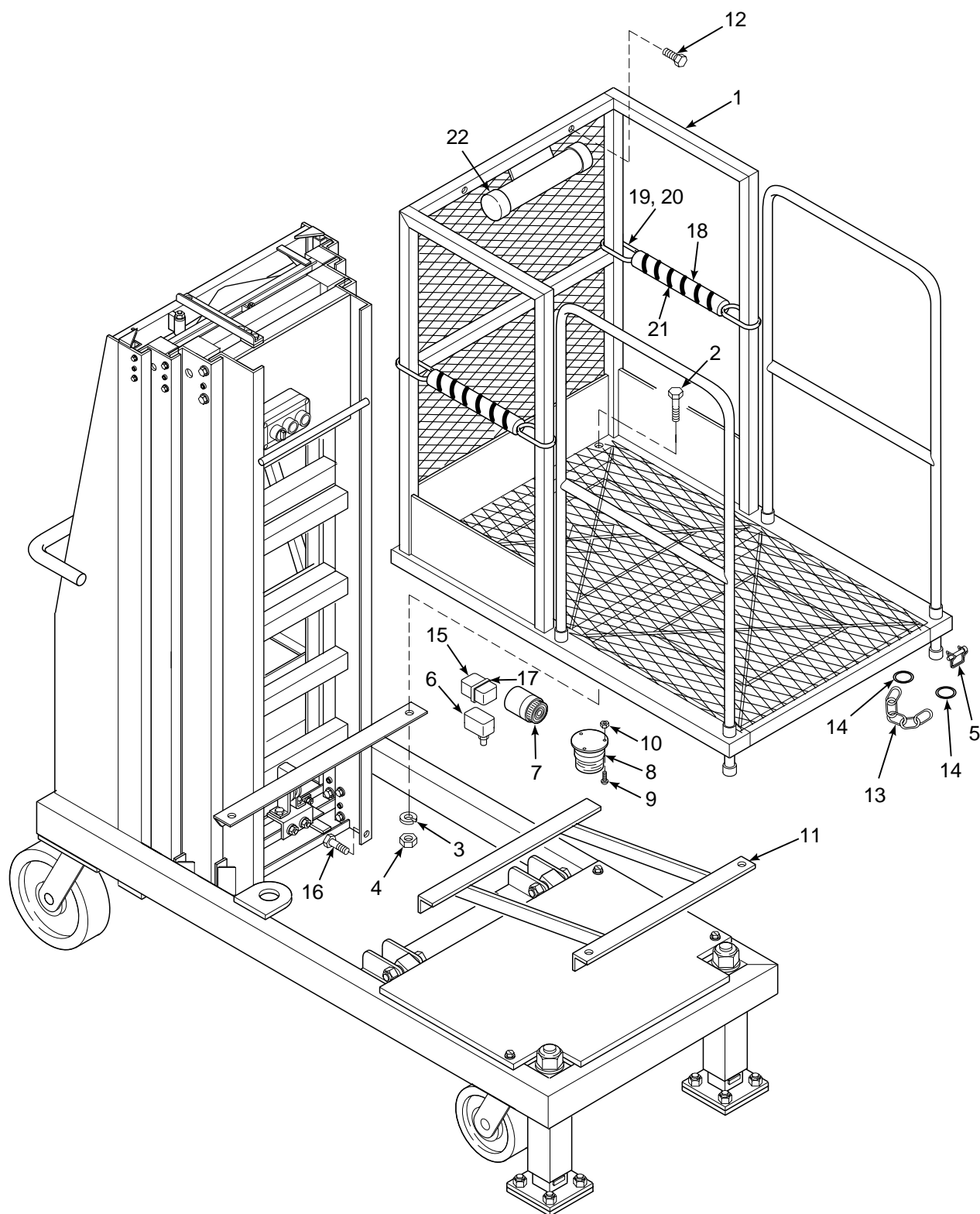


Figure 6-9. Platform Exploded View

Table 6-9. Platform Parts List

Item No.	Part No.	Description	Qty
1	B17-00-0057	Platform Weldment	1
2	0090-0051	Bolt, 3/8-16 x 2-3/4 in.	4
3	0090-0210	Washer, Lock, 3/8 in.	8
4	0090-0162	Nut, 3/8-16	8
5	0068-061	Pin, Snap	2
6	B01-03-009	Switch, Limit	1
7	B01-10-0002	Alarm, Audible	1
8	B01-10-0004	Light	1
9	0090-0802	Screw, 10-24 x 7/8 in.	3
10	0090-0182	Nut, Lock, 10-24	3
11	B17-00-0058	Support, Platform	1
12	0090-0048	Bolt, 3/8-16 x 2 in.	2
13	B40-00-0019	Chain	2
14	0090-0552	Ring, Key	4
15	B01-03-0002	Cover	1
16	0090-0042	Bolt, 3/8-16 x 1 in.	2
17	B01-09-0030	TyRap	1
18	B05-00-0001	Tube, Foam, 13-1/2 in.	2
19	B00-00-0086	Tube, Split, 8-1/2 in.	4
20	B01-09-0030	TyRap	12
21	B06-00-0167	Tape, Strip, 43 in.	2
22	B00-00-0014	Cap, Manual Tube	2

6-10 HYDRAULIC UNIT PARTS LIST

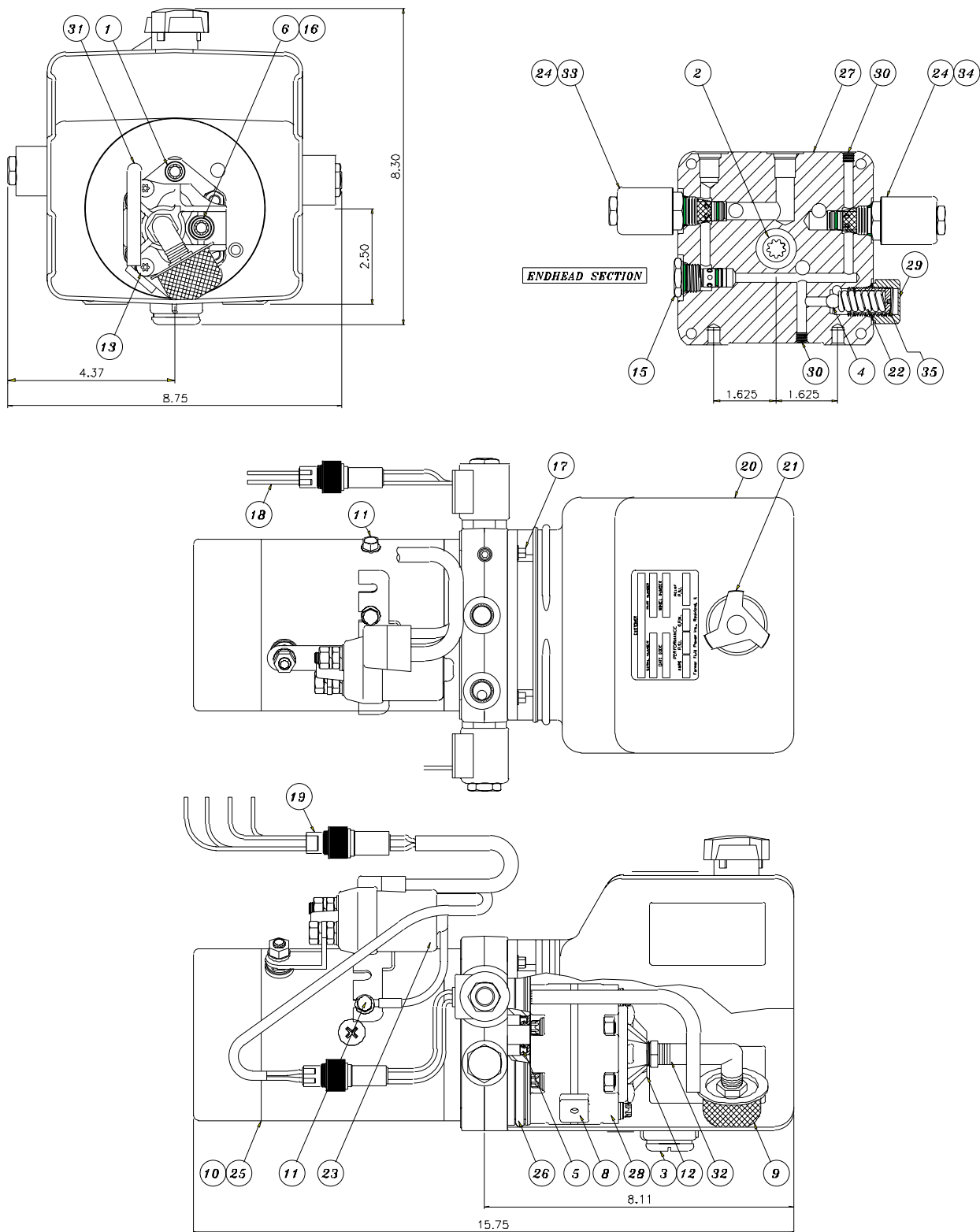


Figure 6-10. Hydraulic Unit Assembly

Table 6-10. Hydraulic Unit Parts List

Item No.	Part No.	Description	Qty
1	B02-15-0088	Bolt, 5/16-24 x 2.75 Torx	2
2	B02-15-0119	Coupler, 9T-20-40	1
3	B02-15-0365	Plug, Drain, 9/16 SAE	1
4	B02-15-0128	Ball, Steel	1
5	B02-15-0091	Seal, Shaft	1
6	B02-15-0093	Washer	1
8	B02-15-0061	Magnet, Plumbing	1
9	B02-15-0121	Filter	1
10	B02-15-0122	Motor, DC - 12V	1
11	B02-15-0123	Screw, Taptite, 1/4-20 x 0.25 Hex	3
12	B02-15-0125	Cover, Suction	1
13	B02-15-0126	Screw, Taptite, M6 x 1.0, 12 mm Torx	3
15	B02-15-0197	Valve, Check, Cartridge	1
16	B02-15-0170	Bolt, 5/16-18 x 1.00	1
17	B02-15-0199	Bolt, 12-24 x 0.50 Hex	4
18	B02-15-0348	Wiring Assembly, 2 Pin	1
19	B02-15-0346	Wiring Assembly, 4 Pin	1
20	B02-15-0206	Tank, Horizontal Mount, Plastic with Drain	1
21	B02-15-0201	Breather Cap, with Check Valve	1
22	B02-15-0127	Spring, Relief	1
23	B02-15-0345	Solenoid, Smart Start	1
24	B02-15-0349	Coil, Solenoid, 12VDC	2
25	B02-15-0114	Pin, 1/8 x 1/4	1
26	B02-15-0073	O-Ring	1
27	B02-15-0203	Head, End	1
28	B02-15-0078	Pump Assembly, 1.6 GPM	1
29	B02-15-0030	Cap Assembly, Relief	1
30	B02-15-0204	Plug, 1/16 NPT Flush	2
31	B02-15-0205	Tube, Return, 3/8, 90°	1
32	B02-15-0059	Elbow, Nylon	1
33	B02-15-0357	Valve, Cartridge NC	1
34	B02-15-0351	Valve Body, 2 Way NO	1
35	B02-15-0026	Screw, Valve Adjustment	1

6-11 HYDRAULIC FITTINGS AND HOSES DIAGRAM

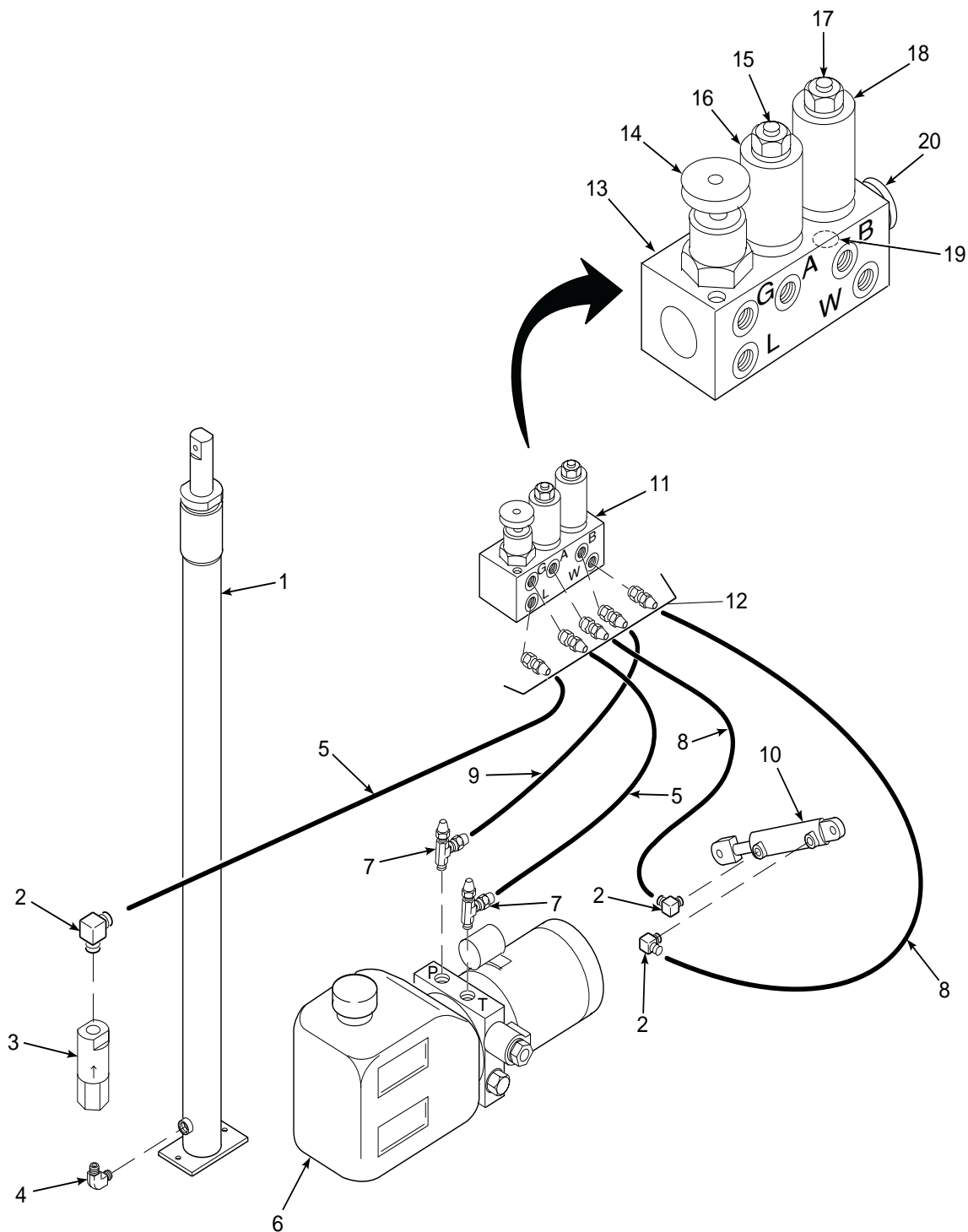


Figure 6-11. Hydraulic Fittings and Hoses Diagram

Table 6-11. Hydraulic Fittings and Hoses Parts List

Item No.	Part No.	Description	Qty
1	B02-03-0018	Cylinder, Hydraulic Lift, 1.5 in. Diameter	1
2	B02-02-0002	Fitting, 4JIC-4NPT 90°, 2501-4	3
3	B02-04-0002	Valve, Flow Control, 1.25 in.	1
4	B02-02-0041	Fitting, 4NPT-4NPT 90°	1
5	B02-01-0110	Hose, Hydraulic, 22 in., 4M3K W/2 4-4FJX	2
6	B02-05-0024	Pump, Hydraulic, Standard DC	1
7	B02-02-0072	Fitting, 4JIC-6ORM 90°, 6801-4-6	2
8	B02-01-0113	Hose, Hydraulic, 80 in., 4M3K W/2 4-4FJX	2
9	B02-01-0124	Hose, Hydraulic, 15 in., 4M3K W/2 4-4FJX	1
10	B02-03-0010	Cylinder, Hydraulic Wheel	1
11	B02-04-0047	Manifold Block, Hydraulic	1
12	B02-02-0163	Fitting, 4JIC-6ORM Nip	5
13	B02-04-0047	Valve, Combination (for Stockpickers and Tom Cats)	1
14	B02-14-0036	Valve, Needle, Emergency Down	1
15	B02-14-0038	Valve, Cartridge, NC, Lift Cylinder	1
16	B01-08-0002	Coil, 12v, Lift	1
17	B02-14-0037	Valve, Cartridge, NC, Wheel Cylinder	1
18	B01-08-0011	Coil, 12v, Wheel	1
19	B02-14-0039	Disc, Orifice	1
20	B02-02-0194	Plug, SAE 4	3

6-12 HYDRAULIC FITTINGS AND HOSES SCHEMATIC

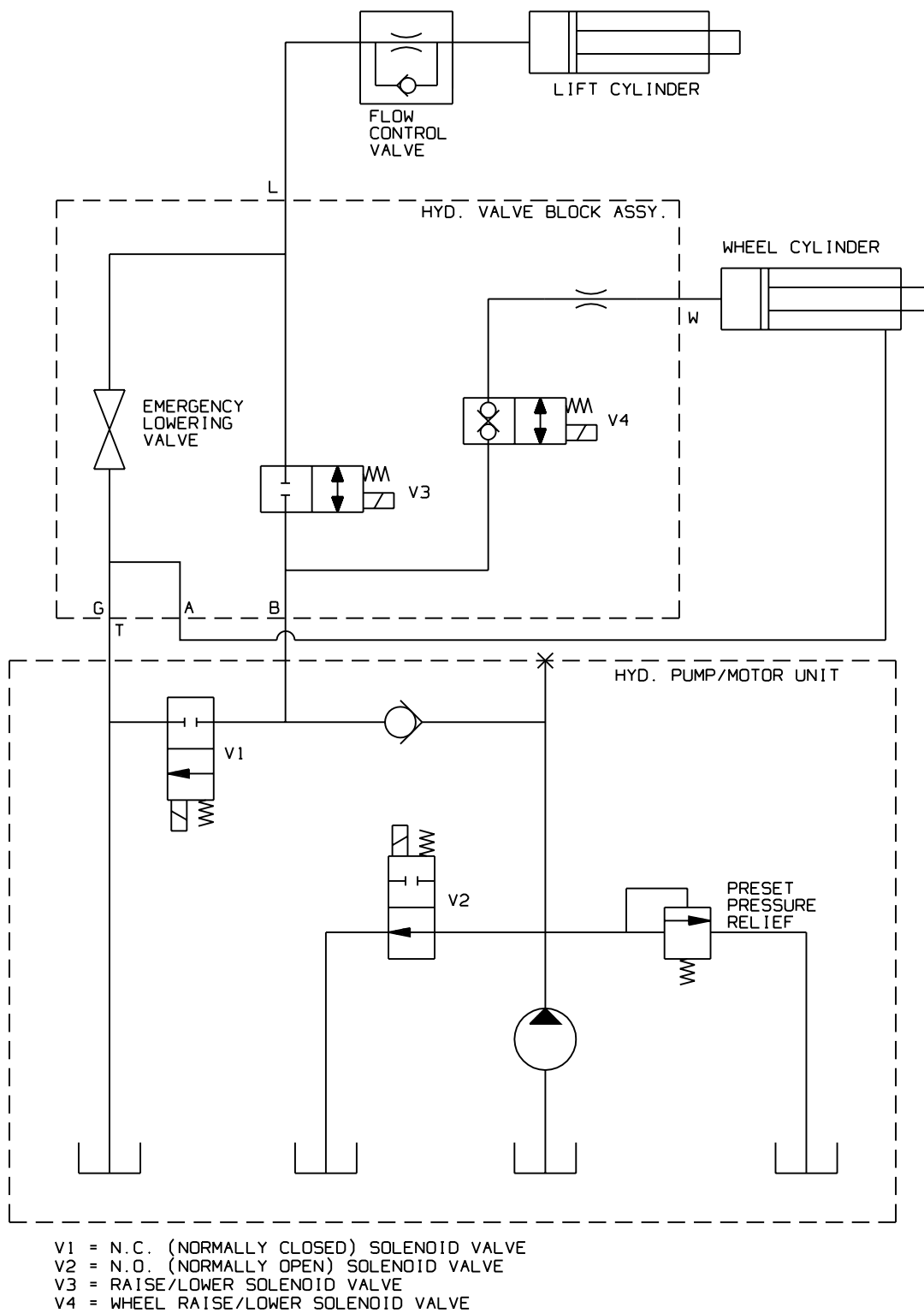
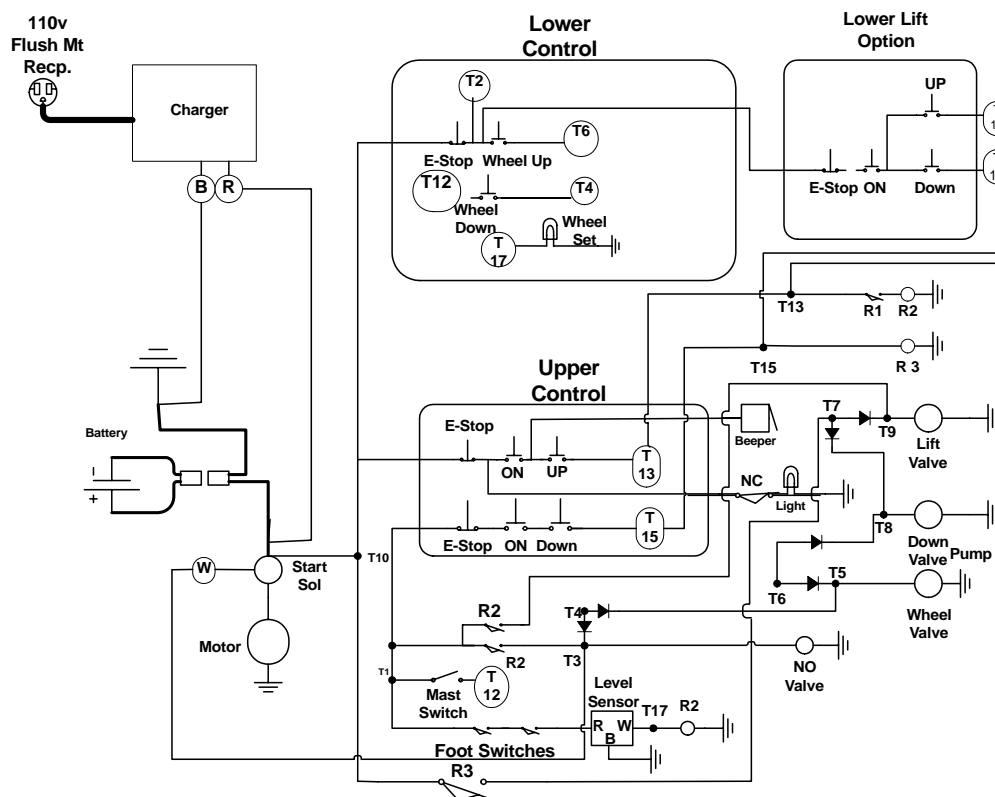


Figure 6-12. Hydraulic Fittings and Hoses Schematic

6-13 ELECTRICAL DIAGRAM

1571/1071 Schematic



Terminal Connections for Black Box					
Terminal No.	Wire Color	From	Terminal No.	Wire Color	From
1	BLK BLK	Mast Down Limit Switch Upper Control Box	11	RED WHT	Level Sensor Left Foot Limit Switch
2	BLK BLK	Lower Control Box Right Foot Limit Switch	12	WHT ORG/BLK STR	Mast Down Limit Switch Lower Control Box
3	WHT	Hydraulic Pump Motor	13	WHT YEL	Upper Control Box Lower Control Box
4	BRN/BLK STR	Lower Control Box	14		
5	RED	Hydraulic Manifold	15	GRN RED/BLK STR	Upper Control Box Lower Control Box
6	YEL/BLK STR	Lower Control Box	16		
7			17	WHT RED	Level Sensor Lower Control Box
8	BLK	Hydraulic Pump Motor	18		
9	BLK	Hydraulic Manifold	19	GRN WHT BLK	Hydraulic Manifold Hydraulic Manifold Level Sensor
10	RED BLU GRN	Upper Control Box Lower Control Box Hydraulic Pump Motor	20	BRN BLK	Lower Control Box Base Ground

Figure 6-13. Electrical Diagram

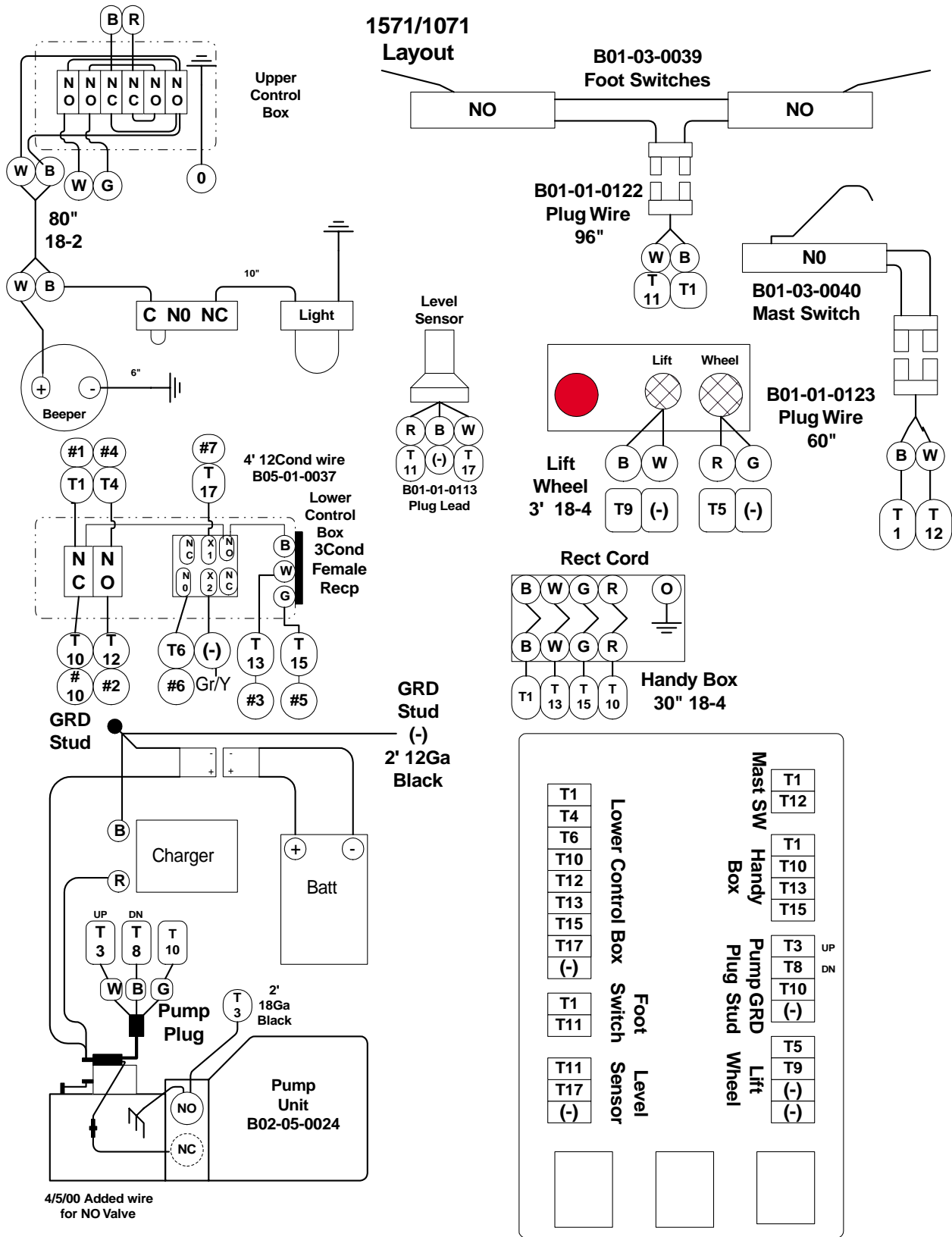


Figure 6-14. Electrical Layout Diagram

7

ANSI Reprint

The following sections are reprinted from the ANSI A92.3-1990 code in effect at the time of manufacture. Permission to reprint has been granted by the Scaffold Industry Association.

5. Responsibilities of Dealers

5.1 Basic Principles. Sound principles of safety, training, inspection, maintenance, applications, and operation consistent with all data available regarding the parameters intended use and expected environment shall be applied in the training of operators, in maintenance, application, and operation of the aerial platform with due consideration of the knowledge that the unit will be carrying personnel.

5.2 Manuals. Dealers shall keep and maintain copy(ies) of the operating and maintenance manual(s) required in 4.17. Copy(ies) of operating manual(s) shall be provided upon each rental or lease delivery. Copy(ies) of operating and maintenance manual(s) shall be provided upon each sale delivery. The operating manual(s) shall be stored in the location required by 4.18. These manual(s) are considered an integral part of the aerial platform and are vital to communicate necessary safety information to users and operators.

5.3 Predelivery Preparation. Aerial platforms shall be inspected, serviced, and adjusted to manufacturer's requirements prior to each delivery by sale, lease, or rental.

5.4 Maintenance Safety Precautions. Before adjustments and repairs are started on an aerial platform, the following precautions shall be taken as applicable: (1) All controls in the "off" position and all operating features secured from inadvertent motion by brakes, blocks, or other means. (2) Powerplant stopped and starting means rendered inoperative (3) Platform lowered to the full down position, if possible, or otherwise secured by blocking or cribbing to prevent dropping (4) Hydraulic oil pressure relieved from all hydraulic circuits before loosening or removing hydraulic components (5) Safety props or latches installed where applicable as described by the manufacturer.

5.5 Replacement Parts. When parts or components are replaced, they shall be identical or equivalent to original aerial platform parts or components

5.6 Training. Whenever a dealer directs or authorizes an individual to operate an aerial platform, the dealer shall ensure that the individual has been trained under the direction of a qualified person in accordance with the manufacturer's operating and maintenance manual and requirements listed in Section 8 before operating the aerial platform.

5.6.1 Training on Delivery. Manufacturer's operating instruction and required training on the proper use and operation of the aerial platform shall be provided upon each delivery, by sale, lease, or rental.

5.7 Operation. When a dealer operates an aerial platform in sales demonstrations or for other beneficial use, the dealer shall assume the responsibilities of users as specified in Section 7 and the operating personnel shall assume the responsibilities of operators as specified in Section 8 of this standard.

5.8 Assistance to Owners and Users. If a dealer is unable to answer an owner's or user's question relating to rated capacity, intended use, maintenance, repair, inspection, or operation of the aerial platform, the dealer shall obtain the proper information from the manufacturer and provide that information to the owner or user.

5.9 Record Retention. Dealer(s) shall retain the following records for at least 3 years: (1) Name and address of the purchaser of each aerial platform by serial number and the date of delivery (2) Records of the person(s) trained upon each delivery of an aerial platform (3) Records of the predelivery preparation performed prior to each delivery.

5.10 Modifications. Modifications or alterations of aerial platforms shall be made only with prior written permission of the manufacturer.

5.11 Manufacturer's Safety Bulletins. The dealer shall comply with safety-related bulletins as received from the manufacturer.

6. Responsibilities of Owners

6.1 Basic Principles. Sound principles of safety, training, inspection, maintenance, application, and operation consistent with all data available regarding the parameters of intended use and expected environment shall be applied in the performance of the responsibilities of owners with due consideration of knowledge that the unit will be carrying personnel.

6.2 Manuals. Owners shall keep and maintain copy(ies) of the operating and maintenance manual(s) required in 4.17 of this standard. Copy(ies) of operating manual(s) shall be provided upon each rental or lease delivery. Copy(ies) of operating and maintenance manuals(s) shall be provided upon each sale delivery. The operating manual(s) shall be stored in the location required in 4.18 of this standard. These manual(s) are considered an integral part of the aerial platform and are vital to communicate necessary safety information to users and operators.

6.3 Maintenance. The owner of an aerial platform shall arrange that the maintenance specified in this standard is properly performed on a timely basis. The owner shall establish a preventive maintenance program in accordance with the manufacturer's recommendations and based on the environment and severity of use of the aerial platform. The owner shall arrange that frequent and annual inspections are performed. All malfunctions and problems noted shall be corrected before the aerial platform is returned to service.

6.4 Frequent Inspection. The owner of an aerial platform shall cause a frequent inspection to be performed on an aerial platform: (1) That has been in service for 3 months or 150 hours, whichever comes first (2) That has been out of service for a period longer than 3 months.

The inspection shall be made by a person qualified as a mechanic on the specific make and model of the aerial platform. The inspection shall include all items specified by the manufacturer for a frequent inspection and shall include, but not be limited to, the following: (3) All functions and their controls for speed(s), smoothness, and limits of motion (4) Emergency lowering means (5) All chain and cable mechanisms for adjustment and worn or damaged parts (6) All emergency and safety devices (7) Lubrication of all moving parts, inspection of filter element(s), hydraulic oil, engine oil, and coolant, as specified by the manufacturer (8) Visual inspection of structural components and other critical components, such as fasteners, pins, shafts, and locking devices (9) Placards, warnings, and control markings (10) Items specified by the manufacturer (11) Correction of all malfunctions and problems identified and further inspection, if necessary.

6.5 Annual Inspection. The owner of an aerial platform shall cause an annual inspection to be performed on the aerial platform no later than 13 months from the date of the prior annual inspection. The inspection shall be made by a person qualified as a mechanic on the specific make and model of the aerial platform. The inspection shall include all items specified by the manufacturer for an annual inspection.

6.6 Maintenance Safety Precautions. Before adjustments and repairs are started on an aerial platform, the following precautions shall be taken as applicable: (1) All controls in the "off" position and all operating features secured from inadvertent motion by brakes, blocks, or other means (2) Powerplant stopped and starting means rendered inoperative (3) Platform lowered to the full down position, if possible, or otherwise secured by blocking or cribbing to prevent dropping (4) Hydraulic oil pressure relieved from all hydraulic circuits before loosening or removing hydraulic components (5) Safety props or latches installed where applicable as described by the manufacturer.

6.7 Replacement Parts. When parts or components are replaced, they shall be identical or equivalent to original aerial platform parts or components.

6.8 Maintenance Training. The owners shall train their maintenance personnel in inspection and maintenance of the aerial platform in accordance with 6.3, 6.4, 6.5, 6.6, 6.7 and 6.9 of this standard, and with the manufacturer's recommendations.

6.9 Operator Training. An owner who directs or authorizes an individual to operate an aerial platform shall ensure that the individual has been trained in accordance with the manufacturer's operating manual, and requirements listed in Section 8 of this standard before operating the aerial platform.

Manufacturer's operating instruction and required training on the proper use and operation of the aerial platform shall be provided upon each delivery, by sale, lease, or rental.

6.10 Operation. When an owner operates an aerial platform, the owner shall have the responsibilities of users as specified in Section 7 of this standard, and the operating personnel shall have responsibilities of operators as specified in Section 8 of this standard.

6.11 Assistance to Users and Operators. If an owner is unable to answer a user's or operator's questions related to rated capacity, intended use, maintenance, repair, inspection, or operation of the aerial platform, the owner shall obtain the proper information from the dealer or manufacturer and provide that information to user or operator.

6.12 Record Retention. The owner shall retain the following records for at least 3 years: (1) Name and address of the purchaser of each aerial platform by serial number and date of delivery (2) Records of the person(s) trained upon each delivery of an aerial platform (3) Written records of the frequent and annual inspections performed by the owner. The record shall include deficiencies found, corrective action, and identification of the person(s) performing the inspection and repairs (4) Records of the predelivery preparation performed prior to each delivery.

6.13 Modifications. The owner shall not modify or concur in modifications or alteration to the aerial platform without the modifications being approved and certified in writing by the manufacturer.

6.14 Manufacturer's Safety Bulletins. The owner shall comply with safety-related bulletins as received from the manufacturer or dealer.

7. Responsibilities of Users.

7.1 Basic Principles. The information in this standard must be supplemented by good job management, safety control, and the application of sound principles of safety, training, inspection, maintenance, application, and operation consistent with all data available regarding the parameters of intended use and expected environment. Since the user has direct control over the application and operation of aerial platforms, conformance with good safety practices in this area is the responsibility of the user and the operating personnel, including the operator. Decisions on the use and operation of the aerial platform must always be made with due consideration for the fact that the machine will be carrying personnel whose safety is dependent on those decisions.

7.2 Manuals. Users shall keep and maintain copy(ies) of the operating and maintenance manual(s) required in 4.17 of this standard. The operating manual(s) shall be stored in the location required in 4.18 of this standard. These manuals are considered an integral part of the aerial platform and are vital to communication of necessary safety information to users and operators.

7.3 Inspection and Maintenance. Users shall inspect and maintain the aerial platform as required to ensure proper operation. The frequency of inspection and maintenance shall be determined by the manufacturer's recommendation and be compatible with operating conditions and the severity of the operating environment. Aerial platforms that are not in proper operating condition shall be immediately removed from service until repaired. Repairs shall be made by a qualified person and the repairs shall be in conformance with the manufacturer's recommendations.

7.3.1 Frequent Inspection. An inspection as outlined in 6.4 of this standard shall be conducted.

7.3.2 Annual Inspection. An inspection as outlined in 6.5 of this standard shall be conducted.

7.3.3 Prestart Inspection. Before use each day or at the beginning of each shift, the aerial platform shall be given a visual inspection and function test including but not limited to the following: (1) Operating and emergency controls (2) Safety devices (3) Personal protective devices, including fall protection (4) Air, hydraulic and fuel system leaks (5) Cables and wiring harness (6) Loose or missing parts (7) Tires and wheels (8) Placards, warnings, and control markings (9) Outriggers, stabilizers, and other structures (10) Guardrail system (11) Items specified by the manufacturer.

7.3.4 Maintenance Safety Precautions. Before adjustments and repairs are started on an aerial platform, the following precautions shall be taken as applicable: (1) All controls in the "off" position and all operating features secured from inadvertent motion by brakes, blocks, or other means (2) Powerplant stopped and starting means rendered inoperative (3) Platform lowered to the full down position, if possible, or otherwise secured by blocking or cribbing to prevent dropping (4) Hydraulic oil pressure relieved from all hydraulic circuits before loosening or removing hydraulic components (5) Safety props or latches installed where applicable as described by the manufacturer (6) Precautions specified by the manufacturer.

7.4 Replacement Parts. When parts or components are replaced, they shall be identical or equivalent to original aerial platform parts or components.

7.5 Maintenance Training. The user shall train the maintenance personnel in inspection and maintenance of the aerial platform in accordance with 7.3, 7.4, and 7.6 of this standard and with the manufacturer's recommendations.

7.6 Operator Training. Whenever a user directs or authorizes an individual to operate an aerial platform, the user shall ensure that the individual has been trained in accordance with the manufacturer's operation and maintenance manual, the user's work instructions, and the requirements listed in Section 8 of this standard before operating the aerial platform.

7.6.1 Model Training. The user shall be responsible for the operator being trained on the model of the aerial platform to be operated. Such training shall be in an area free of obstructions, under the direction of a qualified person for a time sufficient to determine that the trainee displays proficiency in knowledge and actual operation of the aerial platform. Only properly trained and authorized personnel shall be permitted to operate the aerial platform.

7.6.2 Trainees Training Record. A record of the trainee's aerial platform instruction shall be maintained by the user for at least 3 years.

7.7 Before Operation. Before authorizing an operator to operate an aerial platform, the user shall ensure that the operator has: (1) Been instructed by a qualified person in the intended purpose and function of each control (2) Read and understood the manufacturer's operating instructions and user's safety rules, or been trained by a qualified person on the contents of the manufacturer's operating instructions and user's safety rules (3) Understood by reading or by having a qualified person explain all decals, warnings, and instructions displayed on the aerial platform (4) Determine that the purpose for which the aerial platform is to be used is within the scope of the intended applications defined by the manufacturer (5) Been provided with approved fall protection devices and other safety gear for all personnel on the platform (see 4.9.5).

7.8 Work Place Inspection. Before the aerial platform is used and during use, the user shall check the area in which the aerial platform is to be used for possible hazards such as, but not limited to: (1) Drop-offs or holes (2) Bumps and floor obstructions (3) Debris (4) Overhead obstructions and high voltage conductors (5) Hazardous locations (6) Inadequate surface and support to withstand all load forces imposed by the aerial platform in all operating configurations (7) Wind and weather conditions (8) Other possible unsafe conditions (9) Presence of unauthorized persons.

7.9 During Operation. The aerial platform shall be used in accordance with this standard. The user shall direct the operator to ensure the following before each elevation of the platform: (1) That the aerial platform is operated on a surface within the limits specified by the manufacturer (2) That the outriggers, stabilizers, extendable axles, or other stabilizing methods are used as required by the manufacturer (3) That guardrails are installed and access gates or openings are closed per manufacturer's instructions (4) That the load and its distribution on the platform and any platform extension are in accordance with the manufacturer's rated capacity for that specific configuration (5) That there is adequate clearance from overhead obstructions (6) That the minimum safe approach distances (MSAD) to energized power lines and parts, as listed in Table One are maintained. See Figure 2 for examples of safe operating procedures (7) That the precautions defined in 7.3.3, 7.6, 7.7, 7.8, 7.9, 7.10 and 7.11 of this standard are followed during operation of the aerial platform.

7.10 Determination of Hazardous Locations. It shall be the responsibility of the user to determine the hazard classification of any particular atmosphere or location according to ANSI/NFPA 505-1987. Aerial platforms operated in hazardous locations shall be approved in accordance with, and of the type required, by ANSI/NFPA 505-1987.

7.11 Warnings and Instruction. The user shall direct his operating personnel and supervise the work to ensure operation in compliance with the requirements in 7.11.1 through 7.11.14.

7.11.1 Personnel Footing. Personnel shall maintain a firm footing on the platform floor while working thereon. Use of planks, ladders, or any other device on the aerial platform for achieving additional height or reach shall be prohibited.

7.11.2 Other Moving Equipment. When other moving equipment or vehicles are present, special precautions shall be taken to comply with local ordinances or safety standards established for the workplace. Warnings such as, but not limited to, flags, roped-off areas, flashing lights, and barricades shall be used.

7.11.3 Reporting Problems or Malfunctions. The operator shall immediately report to the supervisor any problems or malfunctions that become evident during operation. Any problems or malfunctions that affect the safety or operations shall be repaired prior to continued use of the aerial platform.

7.11.4 Altering Safety Devices. Altering or disabling of interlocks or other safety devices shall be prohibited.

7.11.5 Entanglement. Care shall be taken to prevent rope, electric cords, hoses, etc., from becoming entangled in the aerial platform.

7.11.6 Capacity Limitation. Aerial platform rated capacities shall not be exceeded when loads are transferred to the platform at any height.

7.11.7 Work Area. The operator shall ensure that the area surrounding the aerial platform is clear of personnel and equipment before lowering the platform.

7.11.8 Fueling. The engine shall be shut down while fuel tanks are being filled. Fueling shall be done in a well-ventilated area free of flame, sparks, or other hazards that may cause fire or explosion.

7.11.9 Battery Charging. Batteries shall be charged in a well-ventilated area free of flame, sparks, or other hazards that may cause fire or explosion.

7.11.10 Platform Positioning. The aerial platform shall not be positioned against another object to steady the platform.

7.11.11 Misuse as a Crane. The aerial platform shall not be used as a crane.

7.11.12 Operating Areas. The aerial platform shall not be operated from a position on trucks, trailers, railway cars, floating vessels, scaffolds, or similar equipment, unless the application is approved in writing by the manufacturer.

7.11.13 Travel Conditions. Under all travel conditions, the operator shall limit travel speed according to conditions of ground surface, congestion, visibility, slope, locations of personnel, and other factors causing hazards of collision or injury to personnel.

7.11.14 Unauthorized Use. Means shall be used to protect against use by unauthorized person(s).

7.12 Operation of the Aerial Platform. If a user is also the operator of an aerial platform, the user shall have the responsibilities of operators specified in Section 8 of this standard as well as responsibilities of users as specified in Section 7 of this standard.

7.13 Assistance to Operator. If a user is unable to answer any operator's questions relating to rated capacity, intended use, maintenance, condition, or safety of operation of the aerial platform, the user shall obtain the proper information from the dealer, owner, or manufacturer and provide that information to the operator before use of the aerial platform in the application of concern.

7.14 Shutdown of Aerial Platform. The user shall authorize and direct the operating personnel to cease operation of the aerial platform in case of any suspected malfunctions of the aerial platform, or any hazard or potentially unsafe condition that may be encountered, and to request further information as to safe operation from the owner, dealer, or manufacturer before further operation of the aerial platform.

7.15 Record Retention. The user shall retain the following records for at least 3 years: (1) Records of the operator(s) trained on each model of an aerial platform (2) Written records of the frequent and annual inspections shall be kept by the user when performing the inspections. The records shall include the date of inspection, any deficiencies found, the corrective action recommended and identification of the person(s) performing the inspection (3) Written records of all repairs accomplished on the aerial platform, including the date of any such repair, a description of the work accomplished, and the identification of the person(s) performing the repair.

7.16 Modifications. A user shall not modify or concur in modification of an aerial platform without the specific written approval of the manufacturer of the aerial platform.

7.17 Manufacturer's Safety Bulletins. The user shall comply with safety-related bulletins as received from the manufacturer, dealer, or owner.

8. Responsibilities of Operators

8.1 Basic Principles. The information in this standard shall be supplemented by good judgment, safety control, and caution in evaluating each situation. Since the operator is in direct control of the aerial platform, conformance with good safety practices in this area is the responsibility of the operator. The operator shall make decisions on the use and operation of the aerial platform with due consideration for the fact that his or her own safety as well as the safety of other personnel on the platform is dependent on those decisions.

8.2 Manuals. The operator shall be aware that the operating safety manuals, including the manual that defines the responsibilities of dealers, owners, lessors, lessees, users, and operators are stored on the aerial platform and the location where they are stored. The operator shall be familiar with the manuals stored on the aerial platform and consult them when questions arise with respect to the aerial platform.

8.3 Prestart Inspection. Before use each day or at the beginning of each shift, the aerial platform shall be given a visual inspection and functional test including but not limited to the following: (1) Operating and emergency controls (2) Safety devices (3) Personal protective devices, including fall protection (4) Air, hydraulic, and fuel system leaks (5) Cables and wiring harness (6) Loose or missing parts (7) Tires and wheels (8) Placards, warnings, and control markings (9) Outriggers, stabilizers, and other structures (10) Guardrail system (11) Items specified by the manufacturer.

8.4 Problems or Malfunctions. Any problems or malfunctions that affect the safety of operations shall be repaired prior to the use of the aerial platform.

8.5 Training. The operator shall have been trained either on the same model of aerial platform or one having operating characteristics and controls consistent with the one to be used during actual work site operation. The operator trainee shall operate the aerial platform in an area free of obstructions under the direction of the qualified person for a time sufficient to determine that the trainee displays proficiency in knowledge and actual operation of the aerial platform. Only properly trained and authorized personnel shall be permitted to operate the aerial platform.

8.6 Before Operation. Before being authorized to operate the aerial platform, the operator shall have: (1) Been instructed by a qualified person in the intended purpose and function of each of the controls (2) Read and understood the manufacturer's/owner's operating instructions and safety rules, or been trained by a qualified person on the contents of the manufacturer's/owner's operating instructions and safety rules (3) Understood by reading or by having a qualified person explain all decals, warnings, and instructions displayed on the aerial platform.

8.7 Workplace Inspection. Before the aerial platform is used and during use, the operator shall check the area in which the aerial platform is to be used for possible hazards such as, but not limited to: (1) Drop-offs or holes (2) Bumps and floor obstructions (3) Debris (4) Overhead obstructions and high voltage conductors (5) Hazardous locations (6) Inadequate surface and support to withstand all load forces imposed by the aerial platform in all operating configurations (7) Wind and weather conditions (8) Other possible unsafe conditions.

8.8 During Operation. The aerial platform shall be used in accordance with this standard. The operator shall ensure the following before each elevation of the platform: (1) That the aerial platform is operated on a surface within the limits specified by the manufacturer (2) That the outriggers, stabilizers, extendable axles, or other stability enhancing means are used as required by the manufacturer (3) That the guardrails are installed and access gates or openings are closed per manufacturer's instructions (4) That the load and its distribution on the platform and any platform extensions are in accordance with the manufacturer's rated capacity for that specific configuration (5) That there is adequate clearance from overhead obstructions (6) That the minimum safe approach distances (MSAD) to energized power lines and parts, as listed in Table One, are maintained. See Figure 2 for examples of safe operating procedures (7) That he or she and all other personnel on the platform are wearing fall protection devices and other safety gear as required at all times (see 4.9.5).

8.9 Determination of Hazardous Locations. It shall be the responsibility of the user to determine the hazard classification of any particular atmosphere or location according to ANSI/NFPA 505.

8.9.1 Hazardous Location Operating Requirements. Aerial platforms operated in hazardous locations shall be approved and of the type required by ANSI/NFPA 505.

8.10 Warnings and Instructions. The operator and other personnel on the platform shall comply with the requirements in 8.10.1 through 8.10.17.

8.10.1 Personnel Footing. Personnel shall maintain a firm footing on the platform floor while working thereon. Use of planks, ladders, or any other devices on the aerial platform for achieving additional height or reach shall be prohibited.

8.10.2 Other Moving Equipment. When other moving equipment or vehicles are present, special precautions shall be taken to comply with local ordinances or safety standards established for the workplace. Warnings such as, but not limited to, flags, roped off areas, flashing lights, and barricades shall be used.

8.10.3 Reporting Problems or Malfunctions. The operator shall immediately report to a supervisor any problems or malfunctions that become evident during operation. Any problems or malfunctions that affect the safety of operation shall be repaired prior to continued use of the aerial platform.

8.10.4 Reporting Potential Hazardous Locations. The operator shall immediately report to a supervisor any potential hazardous locations (environment) that become evident during operation.

8.10.5 Altering Safety Devices. Altering or disabling of interlocks or other safety devices shall be prohibited.

8.10.6 Entanglement. Care shall be taken to prevent rope, electric cords, hoses, etc., from becoming entangled in the aerial platform.

8.10.7 Capacity Limitation. Aerial-platform rated capacities shall not be exceeded when loads are transferred to the platform at any heights

8.10.8 Work Area. The operator shall ensure that the area surrounding the aerial platform is clear of personnel and equipment before lowering the platform.

8.10.9 Fueling. The engine shall be shut down while fuel tanks are being filled. Fueling shall be done in a well-ventilated area free of flame, sparks, or other hazards that may cause fire or explosion.

8.10.10 Battery Charging. Batteries shall be charged in a well-ventilated area free of flame, sparks, or other hazards that may cause fire or explosion.

8.10.11 Platform Positioning. The aerial platform shall not be positioned against another object to steady the platform.

8.10.12 Misuse as a Crane. The aerial platform shall not be used as a crane.

8.10.13 Operating Areas. The aerial platform shall not be operated from a position on trucks, trailers, railway cars, floating vessels, scaffolds, or similar equipment, unless the application is approved in writing by the manufacturer.

8.10.14 Travel Conditions. Under all travel conditions, the operator shall limit travel speed according to conditions of ground surface, congestion, visibility, slope, location of personnel, and other factors causing hazards of collision or injury to personnel.

8.10.15 Unauthorized Use. Means shall be used to protect against use by unauthorized person(s).

8.10.16 Misuse as a Jack. The platform of the aerial platform shall not be used to jack the wheels off the ground unless the machine is designed for that purpose by the manufacturer.

8.10.17 Snagged Platform. If the platform or elevating assembly becomes caught, snagged, or otherwise prevented from normal motion by adjacent structure or other obstacles such that control reversal does not free the platform, all personnel shall be removed from the platform before attempts are made to free the platform using ground controls.

8.11 Assistance to Operator. If an operator encounters any suspected malfunction of the aerial platform, or any hazard or potentially unsafe condition relating to capacity, the operator shall cease operation of the aerial platform and request further information as to safe operation from management, or from the owner, dealer, or manufacturer, before further operation of the aerial platform.

8.12 Modifications. An operator shall not modify or concur in modification of an aerial platform without the specific written approval of the manufacturer of the aerial platform.

9. Responsibilities of Lessors

9.1 Basic Principles. Sound principles of safety, training, inspection, maintenance, application, and operation consistent with all data available regarding the parameters of intended use and expected environment shall be applied in the performance of responsibilities of lessors with due consideration of the knowledge that the unit shall be carrying personnel.

9.2 Lessor. A lessor is a person(s) or entity who leases, rents, loans, or otherwise provides an aerial platform to another party for the beneficial use of that party (the user). A lessor may also be a dealer, owner, lessee, user, or operator.

9.2.1 Lessor as a Dealer. When a lessor uses the aerial platform as a dealer, the lessor shall have the responsibilities of dealers as specified in Section 5 of this standard.

9.2.2 Lessor as an Owner. When a lessor uses the aerial platform as an owner, the lessor shall have responsibilities of owners as specified in Section 6 of this standard.

9.2.3 Lessor as a User. When a lessor uses the aerial platform as a user, the lessor shall have the responsibilities of operators as specified in Section 8 of this standard.

10. Responsibilities of Lessees

10.1 Basic Principles. Sound principles of safety, training, inspection, maintenance, application, and operation consistent with all data available regarding the parameters of intended use, and expected environment, shall be applied in the performance of responsibilities of lessees with due consideration of the knowledge that the aerial platform carries personnel.

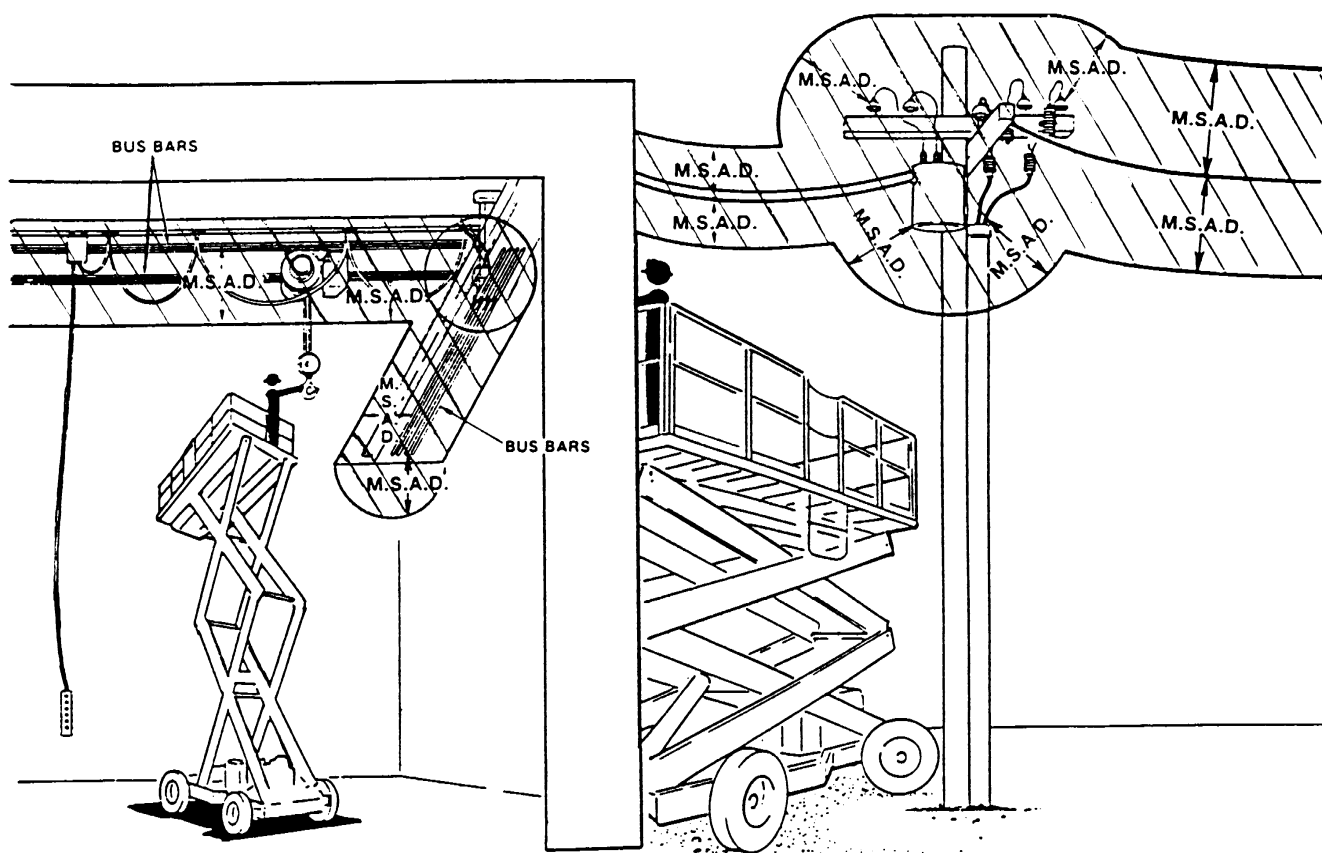
10.2 Lessee. A lessee is a person(s) or entity to whom an aerial platform is provided by lease, rental, loan, or other arrangement. A lessee may also be a user or operator.

10.2.1 Lessee as a Dealer. When a lessee uses the aerial platform as a dealer, the lessee shall have the responsibilities of dealers as specified in Section 5 of this standard.

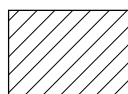
10.2.2 Lessee as an Owner. When a lessee uses the aerial platform as an owner, the lessee shall have the responsibilities of owners as specified in Section 6 of this standard.

10.2.3 Lessee as a User. When a lessee uses the aerial platform as a user, the lessee shall have the responsibilities of users as specified in Section 7 of this standard.

10.2.4 Lessee as an Operator. When a lessee uses the aerial platform as an operator, the lessee shall have the responsibilities of operators as specified in Section 8 of this standard.



M.S.A.D. = Minimum Safe Approach Distance (See Table 7-1).



DENOTES PROHIBITED ZONE

DANGER

- Do not allow machine, personnel, or conductive materials inside prohibited zone.
- Maintain M.S.A.D. from all energized lines and parts as well as those shown.
- Assume all electrical parts and wires are energized unless known otherwise.

CAUTION

Diagrams shown are only for purposes of illustrating M.S.A.D. work positions, not all work positions.

**Table 7-1. Minimum Safe Approach Distance (M.S.A.D.) to energized
(exposed or insulated) power lines and parts.**

Voltage Range (Phase to Phase)	Minimum Safe Approach Distance	
	(Feet)	(Meters)
0 to 300V	Avoid Contact	
Over 300V to 50KV	10	3.05
Over 50KV to 200KV	15	4.60
Over 200KV to 350KV	20	6.10
Over 350KV to 500KV	25	7.62
Over 500KV to 750KV	35	10.67
Over 750KV to 1000KV	45	13.72



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